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Down to the Rate of July, 1909

Pig Iron Output Now 22.5 Per Cent. Less Than in February

The reduction in pig iron output in August was insignificant, the coke and anthracite furnaces producing 2,106,847 tons, against 2,148,442 tons in July. On September 1 the 243 furnaces in blast had a daily capacity of 66,468 tons, against 253 furnaces with 68,368 tons daily capacity on August 1. Production on September 1 was at the rate of about 24,500,000 tons a year for all kinds of iron, charcoal iron included, whereas the record outputs were 25,781,361 tons in 1907 and 25,795,471 tons in 1909.

Our pig iron production in August was smaller than in any month since July, 1909. The list of active furnaces at the opening of this month was 70 less than the maximum of 313 reached February, and the yearly rate of production was 7,150,000 tons less than the February rate of 31,650,000 tons—a falling off of 22.5 per cent. in seven months.

As to the condition of stocks, definite information is lacking. In western Pennsylvania the Mahoning and Shenango valleys and on the south shore of Lake Erie there was an increase in August; an increase also in Virginia, but a decrease in Alabama, while the limited stocks in eastern Pennsylvania remained about stationary. The steel works companies lowered their stocks somewhat. It would seem that there is still a call for curtailment in production.

The pig iron trade is not building high hopes on the activity developed in spots in the past two weeks. The prices realized were not encouraging, though it is recalled that buying movements have sometimes followed just such cuts. The basis of sales for 1911 is the chief matter of moment now. Sellers want from 50c. to $1 advance from the low level; but buyers are not ready to pay an advance. There are indications that common ground may be found for 1911 buying on a pretty liberal scale before the end of the month. In the Chicago district over 100,000 tons is involved in inquiries for the first quarter and first half of next year.

Several sales of basic iron have been made, including 10,000 tons in northern Ohio for shipment to Chicago, and 5000 tons at Philadelphia, the latter somewhat below $15. At St. Louis one steel casting interest has withdrawn an inquiry for 10,000 tons of basic iron and another has come into the market for 5000 tons.

Some little interest has been shown in sheet bars in the Central West and offers of Bessemer sheet bars at $25 at maker's mill are reported.

In finished materials manufacturing and consumption are in close relation, conditions being plainly against contracting in a large way. The recent low prices on pig iron have had their effect on finished lines. While steel manufacturers are showing no special eagerness to take business as the tonnage on their

order books diminishes, the policy of buyers rests on the plain indications that any higher prices are an indefinite distance in the future.

Some good export business in rails is pending and is expected to be closed shortly. In other products also the export trade is quite satisfactory. The Grand Trunk is in the market for 10,000 tons of rails.

In structural work the chief new item is 5100 tons of bridges for the Oregon Trunk Line, taken by the Pennsylvania Steel Company. At Cleveland the Cleveland Electric Illuminating Company's building, 3100 tons, brought out sharp competition.

The Portland, Maine, water pipe contract, on which bids are to be opened next Monday, will call for 12,000 tons of 42-in. cast iron pipe and 6300 tons of 48-in. riveted steel pipe.

Thus far the only increase in tin plate output since the strike against the leading producer was declared off is at Elwood, Ind. Shipments on accumulated orders are very heavy.

Labor Day, 1910

The celebrations of Labor Day throughout the country on Monday were under conditions not greatly different from those of similar anniversaries in other years. The record of the past year shows little indication of any important shifting of position by organized labor or by those who have had occasion to resist its aggressions. In general the year's developments have been favorable to wage earners. Wage advances have been granted by hundreds of employing companies, many of these being made voluntarily, while in other cases, particularly in the railroad service, demands were made which were granted in whole or in part. The strike of the Philadelphia street car men brought out anew the injustice and futility of the sympathetic strike, and latterly the Columbus, Ohio, traction strike has furnished another instance of failure to enforce the closed shop. On the other hand, the Buck's Stove & Range Company settlement with the unions is the one outstanding example, in the labor history of the year, of the restoration of the closed shop régime in a plant which for several years had been classed among open shops. It is probable, however, that too much significance has been given this settlement, so far as the foundry is concerned, in view of the much smaller number of skilled molders now required since the introduction of molding machines. In the iron trade the event of the year has been the formal calling off of the strike in the mills of the American Sheet & Tin Plate Company, marking the end of labor union regulation of any operation of the United States Steel Corporation's subsidiaries.

Progress has been made in the year in the voluntary establishment of added benefits for employees. The pension and accident compensation systems which the United States Steel Corporation has announced, and those of the International Harvester Company and other corporations, represent an outlay of hundreds of thousands of dollars a year. In addition, new employers' liability legislation has taken from employees a certain measure of risk they have borne heretofore and put it upon the employer.

In spite of these new assets of labor which the past year has yielded, the burden of much of the comment on the labor situation that has come out in the past week is the hard lot of wage earners in the United States. Little is said of the high wage scale now ruling in most employments, or of the fact that this is by far the best labor market in the world. The aid of the pulpit has been enlisted on the side of the unions. Their campaign of violence and coercion against men who do not join them is kept in the background, and their lawless aggressions are either justified as inevitable features of a state of war which is assumed to exist when a strike is called or excused as unfortunate episodes in the general movement they are credited with directing in behalf of human betterment.

No feature of labor day or "labor Sunday" oratory is more deplorable than that which assumes a natural hostility between employers and employees. No real progress will be made toward the solution of the labor problem until more emphasis is put upon the community of interest between proprietors and wage earners. The fanning of animosities between men of large means and men whose chief or only capital is manual skill or other ability to earn a daily wage is bound to drive farther apart those who must co-operate if the country is to have any real industrial prosperity. It is most unfortunate, at a time when the country is seeking an opening for another forward movement in industry, that political issues should be made of inequalities in distribution of wealth, as though by the outcome of a single election all that is at fault, or assumed to be at fault, could be set right once for all. What is wanted is not the marshaling of reasons why industrial workers should enter upon a crusade against corporations and why the present social order should be wrenched into alignment with the plans of reformers of the violent type; not the sowing of discord and discontent. The great need to which this year's Labor Day developments point most distinctly is a willingness to recognize recent progress in the improvement of labor conditions and in the spirit of co-operation, not of revolution; to work for peace and friendliness rather than play upon passion and discontent.

A Weakness in Selling Machinery

A manufacturer who uses a large amount of metal working machinery remarked recently that machinery builders frequently fail in their efforts to secure the best methods of handling work in connection with machines that are installed by them. The designer bends his entire energies upon creating a machine to accomplish a certain range of production. He puts it up to the user to ascertain the best methods of handling the work in the machine. This, however, is not always accomplished.

Some companies employ experts whose duties include the task of attacking problems such as these, for the benefit of their salesmen as well as their customers, but probably in the majority of cases the designer ceases his best efforts with the completion of the machine. This fact is occasionally brought to light in the attempt of a salesman to interest a manufacturer in a new type of tool. He quotes a rate of production for a certain work, in the belief that he is promising the customer a large saving over his existing methods. He is then surprised to learn that the rate of production he promises is not nearly so large as is actually being done. The machine is a powerful one. Its cutting ability and accuracy are unquestioned. Its capacity is in reality well in excess of that which the manufacturer quotes back at the salesman for the machines already in use. But the latter does not know the facts, because of his failure to understand that the high rate is due

not so much to the equipment but to the methods employed in handling the work to and from the machine. In manufacturing this counts for a very great deal, as every one familiar with the question understands fully. The salesman should assist the customer in increasing production, not only by means of the machines which he has for sale but in the way of doing work with the machines. Doubtless every salesman would promptly assert that this is exactly what he is always attempting to do. In a great many cases, however, he does not succeed, because he does not know how. He may do the best he can, but he would be at much greater advantage should he be assisted by the results of expert investigation conducted by members of the engineering forces of the company which he represents.

In the case of a new type of milling machine a salesman attempted to interest a manufacturer of agricultural implements, and when asked the output which might be expected stated a figure which was about one-quarter of the actual production with a special machine built by the user and containing few of the new principles of design. It was a serious mistake. Before estimating the output the job should have been studied in all its phases, including the handling of the work.

A Factory Fallacy

In the endeavor to reduce production costs there are two courses open besides that of cheapening the raw material. One of these is to increase the rate of production; to make greater the volume of work flowing through the plant. To this end machines are speeded up to and often beyond the limit, the defense being that, if the life of the machine is so many million pieces, what difference if it is replaced a few years sooner than its slower cousin? To this end also we have the introduction of complications, as, for instance, enabling one machine to accomplish in one stroke what two did before, night and day shifts, &c. Increased production obtained thus usually means considerable investment for new equipment, the funds being obtained often by the deferring of dividends or the acquisition of additional capital. Undertaken too precipitately, it has been known to mean actual costs much greater than estimated; with the best judgment available, it usually possesses in varying degrees the uncertainty of a gamble. This is in addition to the money cost.

The second method by which production cost may be reduced is to cheapen the labor items. This is usually done either by cutting wages or by employing a cheaper grade of help. The results of both of these plans show up favorably at the start in the calculated cost, but there are many who are coming to doubt the ultimate benefit of following such a policy. Where wage cutting or the reduction of the price allowed per piece is resorted to, there will be found to exist a general reluctance on the part of the work people to do their utmost, which puts such a shop in the position of a motor car that misses fire every fourth stroke. And where a cheaper grade of labor is employed, with the same manufacturing conditions, the saving in prime cost is very often more than offset by decreased production, inferior product, spoiled work and an increased overhead expense due to the inferior general intelligence of the working force. Where a shop manager may take the utmost pains to use only the best of material and the latest types of machinery, he is often guilty of the inconsistency of employing inferior help. It is one of the most widespread accepted fallacies of the present.

The auditor of a large manufacturing concern in the East put the matter of rate cutting in a very clear way recently. He was telling how in one of Cæsar's campaigns that ruthless warrior punished the entire garrison of a conquered village by cutting off the right hand of each man at the wrist. The men weren't much good after that. What you want in your factories and mills is not only men with all their faculties alive, but you want those right hands of theirs to be the most willing and skillful in the land—at least, that is what you ought to want. And to get such men, or to make such men out of the members of your present force, it will not be necessary for you to spend thousands for new machinery and buildings; it will not be necessary for you to spend one cent; in fact, it is claimed by students of these matters that it will put money in your pocket at the very first step—the "company" and the "help" will profit alike.

The two steps to be taken are, first, to encourage the workmen by rewarding efficiency, and, second, to fill your shops with the best grade of help that will come to you. Guarantee that no cuts in wages will be made where a man's efficiency enables him to earn more than his fellows. Do not be hoodwinked into believing that you are a gainer in the long run by a policy which takes the very heart out of your workers. It is not your custom to cut a clerk's wages when he proves capable of greater things. You usually raise him and get a better man for the slight outlay.

The Panama Canal and South American Trade

The completion of the Panama Canal is no longer a remote event. The time is approaching so near that sharp rivalry has sprung up among several cities, each of which desires to hold an international exposition to celebrate the completion of this great undertaking, and to direct attention to the part that such cities expect to play in the enjoyment of the increased commerce and general business which will follow the diversion of a large portion of the world's shipping through this short cut to the west coast of America. It seems opportune, therefore, to call the attention of our manufacturers to the necessity of making preparations for enjoying some of the increased trade with South American countries, for which this canal is primarily intended.

Many manufacturers who are in a good position to handle South American trade are expecting that the mere opening of the Panama Canal will completely revolutionize their export business, yet probably only a very few are doing anything toward laying a foundation for this expected foreign trade. This appears to be the case especially with regard to manufacturers of machine tools, who, if they are doing anything, are working along this particular line in but a desultory fashion. Most of them appear to have the vague idea that after the canal is in operation orders will come to them almost without the asking. It is needless to say that those who are entertaining this belief will undoubtedly be disappointed. The time is at hand when there should be a decided awakening as to the necessity of laying a good foundation for the development of the business expected to follow the opening of the canal.

Pig Iron Production

A Small Decrease in August

Capacity Active September 1 Represents About 24,500,000 Tons a Year

Our September 1 returns from the blast furnaces show that production was reduced very little in August, the total of coke and anthracite iron being 2,106,847 gross tons, as compared with 2,148,442 tons in July—a falling off of but 42,000 tons. The number of furnaces in blast September 1 was 243, with a capacity of 66,469 tons a day, a reduction of 10 in the number of active furnaces in the month and of 1900 tons a day in capacity.

The small reduction in output in August was more contributed to by merchant furnaces than by steel works furnaces. The former produced 21,429 tons a day, as against 22,122 tons in July, and the latter 46,534 tons, as against 47,183 tons in July. The daily rate for all furnaces in August, 67,963 tons, was the smallest for any month since July, 1909. Production on September 1 was at the rate of about 24,500,000 tons a year (estimating the production of charcoal iron at about 30,000 tons a month), whereas the output in 1907 was 25,781,361 tons and in 1909 25,795,471 tons.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with August, 1909, is as follows:

Daily Rate of Pig Iron Production by Months.—Gross Tons.

	Steel works.	Merchant.	Total.
August, 1909	51,354	21,192	72,546
September	55,361	24,146	79,507
October	57,067	26,789	83,856
November	56,333	28,584	84,917
December	57,058	27,964	85,022
January, 1910	57,200	26,948	84,148
February	57,876	27,740	85,616
March	56,113	28,346	84,459
April	55,663	27,129	82,792
May	52,235	24,867	77,102
June	51,637	23,879	75,516
July	47,183	22,122	69,305
August	46,534	21,429	67,963

August Output by Districts

The table below gives the production of all coke and anthracite furnaces in August and the four months preceding:

Monthly Pig Iron Production.—Gross Tons.

	April. (30 days)	May. (31 days)	June. (30 days)	July. (31 days)	August. (31 days)
New York	166,307	171,461	163,575	162,901	158,666
New Jersey	29,092	22,973	18,443	18,962	19,177
Lehigh Valley	64,910	70,344	66,944	61,014	63,878
Schuylkill Val.	61,084	65,725	60,349	61,340	64,926
Lower Susquehanna and Lebanon Val.	71,694	65,667	60,315	60,043	54,442
Pittsburgh dis.	543,531	510,514	483,909	502,711	510,352
Shenango Val.	124,440	120,301	130,290	113,280	113,500
West. Penn.	141,246	144,578	132,344	129,786	116,117
Md., Va. and Kentucky	77,032	82,071	82,181	75,051	76,477
Wheeling dis.	106,736	94,217	76,166	73,164	68,341
Mahoning Val.	225,588	218,243	208,988	215,282	211,575
Central and North. Ohio.	181,803	144,344	145,393	139,627	122,960
Hocking Valley, Hanging Rock and S.W.Ohio.	48,264	43,290	41,521	30,163	32,490
Mich.,Minn.,Mo., Wis.,Col.,Wash.	75,802	71,588	68,051	65,863	66,096
Chicago dis.	351,272	358,509	328,953	264,136	258,145
Alabama	173,071	165,937	160,970	143,313	140,015
Tenn., Georgia and Texas	41,889	40,418	37,086	31,806	29,690
Totals	2,483,763	2,390,180	2,265,478	2,148,442	2,106,847

Capacity in Blast September 1 and August 1

The following table shows the daily capacity of furnaces in blast September 1 and August 1. These figures are based largely on the performance of the furnaces in August and July:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks	Sept. 1. Number in blast.	Sept. 1. Capacity per day.	August 1. Number in blast.	August 1. Capacity per day.
New York:					
Buffalo	16	14	4,545	14	4,635
Other New York	7	3	582	3	537
New Jersey	8	3	620	3	612
Spiegel	2	..	....	..	....
Pennsylvania:					
Lehigh Valley	23	12	1,910	12	1,895
Spiegel	3	2	151	2	169
Schuylkill Valley	16	7	1,934	8	2,063
Low. Susquehanna	7	5	928	5	935
Lebanon Valley	10	6	828	7	932
Pittsburgh dis.	50	40	15,524	42	16,010
Spiegel	3	2	366	2	392
Shenango Valley	20	12	3,560	12	3,310
West. Pennsylvania.	27	16	3,840	17	4,280
Maryland	4	4	965	4	973
Wheeling district	14	6	2,205	7	2,369
Ohio:					
Mahoning Valley	23	18	6,483	19	6,573
Central and North.	22	10	3,505	12	4,105
Hocking Val., Hanging Rock and S. W. Ohio	15	8	945	8	887
Illinois and Indiana	31	21	8,230	20	8,245
Spiegel	3	1	240	2	277
Michigan, Wisconsin and Minnesota	10	6	1,010	6	1,075
Colorado, Missouri and Washington	7	4	1,080	5	1,170
The South:					
Virginia	23	11	1,290	11	1,360
Kentucky	5	1	195	1	125
Alabama	46	22	4,585	21	4,510
Tenn. and Georgia	20	9	947	10	1,025
Totals	415	243	66,468	253	68,368

Among furnaces blown out in August were Buffalo Union B in New York, one Bird Coleman in the Lebanon Valley, one Isabella, Soho and one Monongahela in the Pittsburgh district, Sharon in the Shenango Valley, one Cambria in western Pennsylvania, No. 2 Ashland in Kentucky, one Mingo in the Wheeling district, Cherry Valley in the Mahoning Valley, two Lorain in northern Ohio, Belfont in the Hanging Rock district, one Union in the Chicago district, Zenith in Minnesota, Missouri at St. Louis, Helen in Tennessee.

The list of furnaces blown in in the month includes Buffalo Union C in New York, one Eliza in the Pittsburgh district, Hall in the Shenango Valley, Norton in Kentucky, Marting in the Ironton district, one Calumet at South Chicago, one Mayville in Wisconsin, one Pioneer in Alabama.

Production of Steel Companies

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel-making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last are stated separately, but are included in the columns of "total production."

Production of Steel Companies.—Gross Tons.

	Pig.—Total production. 1908.	1909.	1910.	Spiegeleisen and ferromanganese. 1909.	1910.
January	664,415	1,117,823	1,773,201	12,325	19,538
February	745,802	1,073,363	1,620,539	10,046	21,396
March	841,502	1,140,553	1,739,212	23,743	25,591
April	725,548	1,093,092	1,669,898	22,478	22,304
May	759,674	1,256,448	1,619,283	20,834	26,529
June	717,689	1,365,527	1,549,112	16,516	27,680
July	798,639	1,508,762	1,462,689	17,613	22,924
August	897,052	1,591,991	1,442,572	22,313	25,756
September	933,514	1,660,839	.....	28,148	.....
October	996,481	1,769,094	.....	25,384	.....
November	981,167	1,689,994	.....	23,376	.....
December	1,090,339	1,768,799	.....	20,791	.....

Pig Iron Production and Prices Plotted

The fluctuations in pig iron production from January, 1907, to the present time are shown graphically in the accompanying chart. The figures plotted are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron delivered at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

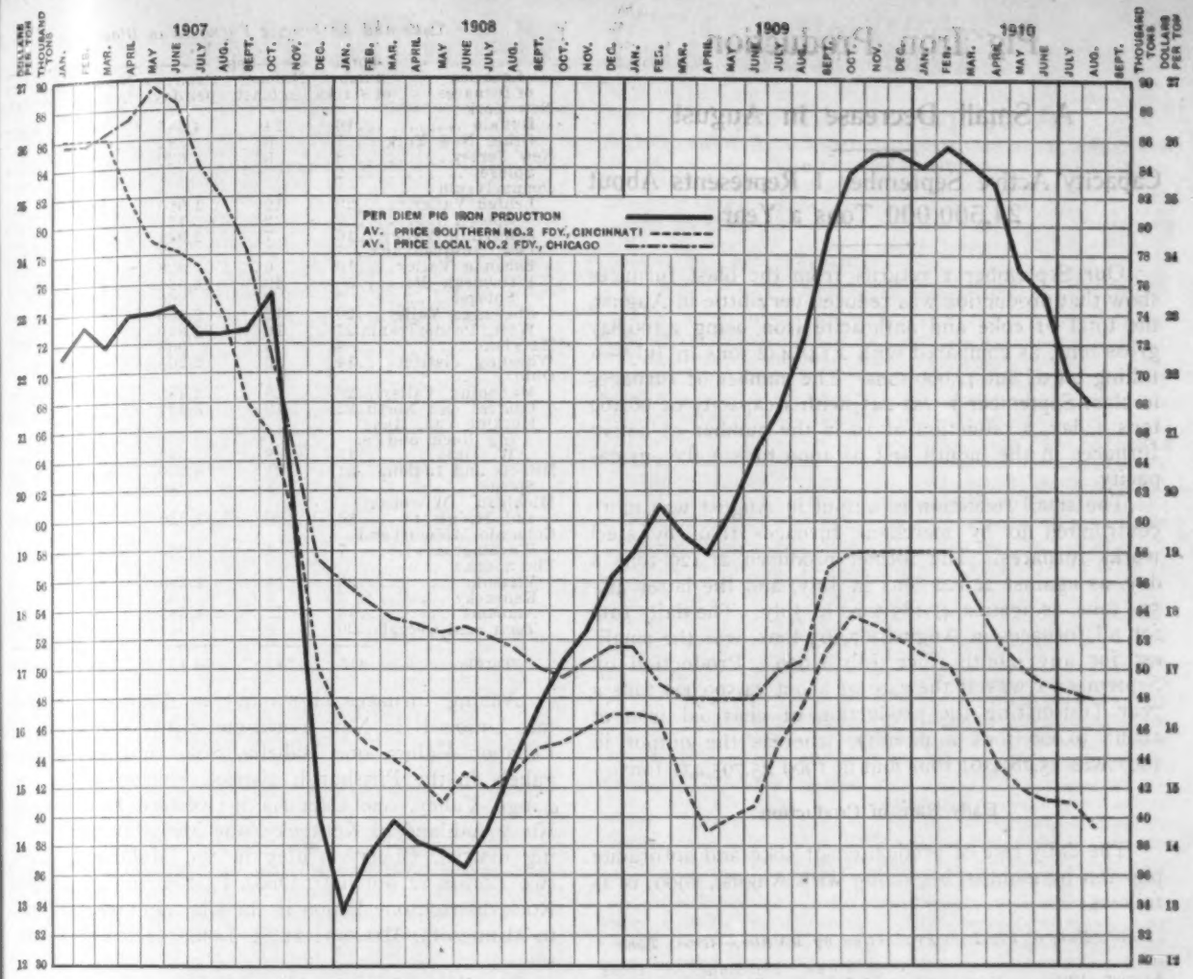

Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to September 1, 1910; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron Delivered at Chicago.

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	71,149	33,718	57,975	84,148
February	73,038	37,163	60,976	85,616
March	71,821	39,619	59,232	84,459
April	73,885	38,289	57,962	82,792
May	74,048	37,603	60,753	77,102
June	74,486	36,444	64,656	75,516
July	72,763	39,287	67,793	69,305
August	72,594	43,851	72,546	67,963
September	72,783	47,300	79,507	.....
October	75,386	50,554	83,856	.....
November	60,937	52,595	84,917	.....
December	39,815	56,158	85,022	.....

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago Since January, 1907.

	1907.		1908.		1909.		1910.	
	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.	Sou. No. 2 Cin.	Loc. No. 2 Chi.
Jan.	26.00	25.85	16.15	18.45	16.25	17.35	17.25	19.00
Feb.	26.00	25.85	15.75	18.16	16.13	16.75	17.06	19.00
March	26.00	26.10	15.50	17.85	15.05	16.50	16.30	18.30
April	25.06	26.35	15.20	17.73	14.25	16.50	15.37	17.50
May	24.25	26.85	14.75	17.63	14.50	16.50	15.00	17.06
June	24.10	26.60	15.25	17.73	14.70	16.50	14.85	16.75
July	23.85	25.55	15.00	17.55	15.75	17.00	14.75	16.56
Aug.	23.00	24.85	15.25	17.35	16.38	17.13	14.31	16.50
Sept.	21.50	24.10	15.65	17.05	17.35	18.70	....	....
Oct.	20.95	22.45	15.75	16.85	17.88	19.00	....	....
Nov.	19.50	20 66	16.00	17.10	17.75	19.00	....	....
Dec.	17.00	18.80	16.25	17.35	17.45	19.00	....	....

The Record of Production

Production of Coal and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.
January	2,205,607	1,045,250	1,797,560	2,608,605
February	2,045,068	1,077,740	1,707,340	2,397,254
March	2,226,457	1,228,204	1,832,194	2,617,949
April	2,216,558	1,149,602	1,738,877	2,483,763
May	2,295,505	1,165,688	1,883,330	2,390,180
June	2,234,575	1,092,131	1,930,866	2,265,478
July	2,255,660	1,218,129	2,103,431	2,148,442
August	2,250,410	1,359,831	2,248,930	2,106,847
September	2,183,487	1,418,998	2,385,206	.....
October	2,336,972	1,567,198	2,599,541	.....
November	1,828,125	1,577,854	2,547,508	.....
December	1,234,279	1,740,912	2,635,680	.....

The Jamison Coal & Coke Company and Its Miners

In connection with the strike of the coal miners in the Latrobe, Connellsville and Greensburg fields in western Pennsylvania, which has been going on for some months, many sensational and untrue reports have been printed in the daily press, which put a number of the coal operators in those districts in a bad light. One of these reports was to the effect that all the coal companies operated company stores and that the earnings of the miners were nearly all absorbed by such stores, leaving practically no money for the miners when their store bills were paid. Such reports have been printed regarding the Jamison Coal & Coke Company, which operates stores with most of its coal mines; these mines being isolated from towns, and being a convenience for the men. This company quotes from its records that for the first six months of 1910 the wages of the miners employed at its various coal mines amounted to $782,049.55, while the deductions by the company for rents, store orders, fuel and tool sharpening amounted to $227,247.11, leaving the sum of $554,802.44, which was paid in cash by the company to its miners. In other words, for the period noted above, the Jamison Coal & Coke Company paid out in cash more than double the deductions made from wages of its miners for all purposes.

Furnace C of the Buffalo Union Furnace Company, Buffalo, N. Y., which has been idle for several months, was blown in August 29. Furnace B was blown out for repairs August 28.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Sept. 7, 1910.	Aug. 31, 1910.	Aug. 3, 1910.	Sept. 8, 1909.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$16.00	$16.00	$16.00	$17.75
Foundry No. 2, Southern, Cincinnati	*14.25*	14.25	14.50	17.25
Foundry No. 2, local, Chicago	16.50	16.50	16.50	18.50
Basic, delivered, eastern Pa.	*15.00*	15.00	15.25	18.00
Basic, Valley furnace	*13.75*	14.00	14.25	15.75
Bessemer, Pittsburgh	*15.90*	15.90	16.15	17.90
Gray forge, Pittsburgh	*14.15*	14.15	14.40	15.90
Lake Superior charcoal, Chicago	18.50	18.50	18.50	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	24.50	24.50	24.50	25.00
Forging billets, Pittsburgh	*29.00*	29.00	30.00	29.00
Open hearth billets, Philadelphia	*27.00*	27.50	27.50	27.50
Wire rods, Pittsburgh	*28.00*	28.00	28.50	31.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago	13.50	13.50	13.50	16.00
Steel rails, melting, Philadelphia	13.75	13.75	13.75	17.25
Iron rails, Chicago	*16.00*	16.00	16.50	19.00
Iron rails, Philadelphia	18.00	18.00	18.00	20.00
Car wheels, Chicago	*14.00*	14.00	14.50	17.75
Car wheels, Philadelphia	*13.75*	13.75	14.00	16.50
Heavy steel scrap, Pittsburgh	*14.25*	14.25	14.50	17.25
Heavy steel scrap, Chicago	12.25	12.25	12.25	15.75
Heavy steel scrap, Philadelphia	13.75	13.75	13.75	17.25
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia	*1.40*	1.40	1.42½	1.50
Common iron bars, Chicago	*1.37½*	1.37½	1.40	1.45
Common iron bars, Pittsburgh	1.45	1.45	1.45	1.50
Steel bars, tidewater, New York	1.56	1.56	1.56	1.56
Steel bars, Pittsburgh	1.40	1.40	1.40	1.40
Tank plates, tidewater, New York	1.56	1.56	1.56	1.56
Tank plates, Pittsburgh	1.40	1.40	1.40	1.40
Beams, tidewater, New York	1.56	1.56	1.56	1.56
Beams, Pittsburgh	1.40	1.40	1.40	1.40
Angles, tidewater, New York	1.56	1.56	1.56	1.56
Angles, Pittsburgh	1.40	1.40	1.40	1.40
Skelp, grooved steel, Pittsburgh	*1.45*	1.45	1.50	1.40
Skelp, sheared steel, Pittsburgh	*1.55*	1.55	1.60	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*2.15*	2.15	2.25	2.20
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.80
Cut nails, Pittsburgh	1.65	1.65	1.65	1.75
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**12.87½**	12.87½	12.75	13.50
Electrolytic copper, New York	**12.62½**	12.62½	12.50	13.12½
Spelter, New York	**5.40**	5.35	5.20	5.85
Spelter, St. Louis	**5.25**	5.20	5.05	5.70
Lead, New York	4.40	4.40	4.40	4.40
Lead, St. Louis	**4.30**	4.30	4.25	4.30
Tin, New York	**36.20**	35.70	33.20	29.95
Antimony, Hallett, New York	*7.87½*	7.87½	8.00	8.37½
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	$3.84	$3.84	$3.84	$3.64

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; zees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net; hand rail tees, 2.50c. net; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots on which jobbers charge the usual discounts for small lots from store are as follows: Blue annealed sheets, Nos. 3 to 8, 1.55c. to 1.60c.; Nos. 9 and 10, 1.60c. to 1.65c.; Nos. 11 and 12, 1.65c. to 1.70c.; Nos. 13 and 14, 1.70c. to 1.75c.; Nos. 15 and 16, 1.80c. to 1.85c. One pass, cold rolled box annealed sheets: Nos. 15 and 16, 1.90c. to 1.95c.; Nos. 17 and 21, 1.95c. to 2c.; Nos. 22 and 24, 2c. to 2.05c.; Nos. 25 and 26, 2.05c. to 2.10c.; No. 27, 2.10c. to 2.15c.; No. 28, 2.15c. to 2.20c.; No. 29, 2.20c. to 2.25c.; No. 30, 2.30c. to 2.35c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2c. to 2.05c.; Nos. 17 to 21, 2.05c. to 2.10c.; Nos. 22 to 24, 2.10c. to 2.15c.; Nos. 25 and 26, 2.15c. to 2.20c.; No. 27, 2.20c. to 2.25c.; No. 28, 2.25c. to 2.30c. Galvanized sheets, Nos. 13 and 14, 2.45c.; Nos. 15 and 16, 2.50c.; Nos. 17 to 21, 2.65c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.05c. to 3.10c.; No. 28, 3.25c. to 3.30c.; No. 29, 3.40c. to 3.45c.; No. 30, 3.60c. to 3.65c. Painted roofing sheets, No. 28, $1.55 to $1.60 per square. Galvanized sheets, No. 28, $2.80 to $2.85 per square, for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	70	54	66	..
⅜ in.	71	57	67	53
½ in.	74	62	70	58
¾ to 6 in.	78	68	74	64
7 to 12 in.	72	57	68	53
Plugged and Reamed.				
1 to 4 in.	76	66	72	62
Extra Strong, Plain Ends.				
⅛ to ⅜ in.	63	51	59	47
½ to 4 in.	70	58	66	54
4½ to 8 in.	66	54	62	50
9, 10, 11 and 12 in.	54	42	..	..
Double Extra Strong, Plain Ends.				
½ to 8 in.	59	48	55	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1¼ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55
6 to 13 in.	61	43

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28 to $28.50; open hearth and chain rods, $28.50 to $29.

Steel Rivets.—Structural rivets, ¾-in. and larger, 1.90c., base; cone head boiler rivets, ¾-in. and larger, 2c., base; ⅝-in. and 11-16-in. take an advance of 15c., and ½-in. and 9-16-in. take an advance of 50c.; in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

THE IRON AND METAL MARKETS

Pittsburgh

PARK BUILDING, September 7, 1910.

Pig Iron.—Several dealers and one or two furnaces near Pittsburgh are offering basic iron at lower prices than the Valley furnaces will name, so that basic to-day is nearly as cheap, delivered in the Pittsburgh district, as it is at Valley furnace. A local open hearth steel interest has bought some odd lots of basic recently at prices ranging from $13.50 to $13.75, Pittsburgh, the iron carrying a freight rate of 60c. a ton for delivery at the buyer's mill. We quote Bessemer iron at $15; basic, $13.75; No. 2 foundry, $13.75 to $14; malleable Bessemer, $14.25, and gray forge, $13.25, all at Valley furnace, with a freight rate of 90c. a ton for delivery in the Pittsburgh district.

Steel.—Makers of soft Bessemer sheet bars located outside the Pittsburgh district are offering them at $25 at their mill, which, with $1 freight, would mean $26, Pittsburgh. This price, however, is higher than the local market, which is not above $25.50, but steel in the form of billets and sheet and tin bars is in the hands of dealers who are offering it at less prices than the mills will name. We quote: Bessemer, 4 x 4 in. billets, $24.50; Bessemer sheet bars, $25.50; open hearth billets, 4 x 4 in., $25 to $25.50; open hearth sheet bars, $26 to $26.50, and forging billets, $29 to $29.50, all f.o.b. Pittsburgh, Wheeling or Youngstown districts.

(By Mail.)

There is no doubt whatever that the feeling in the iron trade is considerably better, and this is borne out by the fact that there are more inquiries in the market, more actual orders are going to the mills and shipments of material to consumers are heavier at present than at any time for some months. The low prices reached for pig iron have brought out considerable inquiries, and some tonnage has been closed aside from that bought by the plow company at South Bend, Ind. Consumers are showing decidedly more interest in the market, and while a good deal of work is being placed at prices that allow little or no profit, there is undoubtedly more business going. Reports received from three or four of the leading steel companies show that actual orders sent to the mills in August and specifications against contracts showed a decided increase over July. Several of the leading steel companies are operating to more than 80 per cent. of ingot capacity, and former conditions in the steel trade have been a good deal worse than now. Inquiries for steel billets and sheet bars are better, but prices are lower than they have been for a long time. Reports are that soft Bessemer sheet bars have been offered on the basis of $25, maker's mill, but not in the Pittsburgh district. Some of the sheet and tin plate concerns have recently made resales of sheet and tin bars to brokers, and in some cases this steel has been offered and sold at lower prices than the mills will name. In finished material some big work is coming up. There is more inquiry for sheets, but prices continue demoralized. The coke and scrap trades are showing some little betterment in demand, but so far prices have not improved. The disappointing feature of the whole situation is the light demand for all kinds of materials from the railroads, and it looks as though the leading roads had decided not to buy anything not actually needed until the legislative situation is clearer.

Ferromanganese.—One or two fair-sized inquiries are in the market and prices seem to be a shade firmer. We quote 80 per cent. foreign at $39.50 to $39.75, f.o.b. Baltimore, the freight rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—This material is somewhat scarce for prompt shipment, and while there is not much new inquiry the tone of the market is stronger. As noted last week, dealers who handle ferrosilicon regard present prices as extremely low and are certain that it will only be a short time until the market is better. We quote 50 per cent. ferrosilicon at $57.50 to $58, delivered, Pittsburgh, and blast furnace ferrosilicon as follows: $23 for 10 per cent., $24 for 11 per cent. and $25 for 12 per cent., f.o.b. Jisco and Ashland furnaces.

Muck Bar.—While there is not much new inquiry, the available supply of muck bar is light, owing to the strike of puddlers belonging to the Sons of Vulcan. Concerns that can furnish muck bar for prompt shipment continue to quote as high as $29 to $29.50, Pittsburgh, for it.

Rods.—There is some new inquiry in the market for small lots to cover current needs. It is stated that consumers are specifying at a fairly satisfactory rate. We continue to quote Bessemer rods at $28 to $28.50 and open hearth and chain rods at $28.50 to $29, Pittsburgh.

Skelp.—High prices continue to be asked by mills rolling grooved and sheared iron plates, owing to the strike of the puddlers belonging to the Sons of Vulcan. A sale of about 1000 tons of sheared iron plates is reported to have been made last week on the basis of about 1.90c. at maker's mill. We quote: Grooved steel skelp, 1.45c. to 1.50c.; sheared steel skelp, 1.55c. to 1.60c.; grooved iron skelp, 1.80c. to 1.85c., and sheared iron skelp, 1.90c. to 1.95c., Pittsburgh

Steel Rails.—There is very little new inquiry for standard sections, but new demand and specifications against contracts for light rails continue active. The Carnegie Steel Company entered orders last week for a considerable tonnage of light rails for shipment to coal mining and lumber interests. We quote standard sections of Bessemer rails at $28, mill, and light rails as follows: 8 to 10 lb., $32; 12 to 14 lb., $29; 16, 20 and 25 lb., $28; 30 and 35 lb., $27.75, and 40 and 45 lb., $27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c., and splice bars at 1.50c., at mill.

Structural Material.—Interest centers on the contract for the new Quebec Bridge, which is expected to be placed October 1. It will require about 75,000 tons, and the estimated cost is from $12,000,000 to $15,000,000. Conditions attached to the bids are very rigid. These require that each bidder on the structure shall deposit $500,000 in cash with the Canadian Government, and the successful bidder must deposit a certified check for 15 per cent. of its bid, to bear 3 per cent. interest and to be returned when the structure has been completed and accepted. The bridge will be of the cantilever type, and will be 1758 ft. between the two piers. Its total length will be 2830 ft. The two piers will each be 36 ft. square at the top and 160 ft. high above water. This middle span of 1758 ft. will be the largest span in the world, the Firth Bridge having a span of 1710 ft., which is the largest at present. It is probable that the Phœnix Bridge Company, American Bridge Company and McClintic-Marshall Construction Company will bid, but there will be other American bidders, as well as several German and English concerns. The American Bridge Company has taken 400 tons for a bridge across the Miami River for the Cincinnati, Hamilton & Dayton Railroad. William Miller & Sons, local contractors, have taken the contract for the building of a railroad bridge at Houston, Texas, and have placed the steel, about 1200 tons, with the Eastern Steel Company, Pottsville, Pa., while the Pennsylvania Steel Company, Steelton, Pa., has taken a contract for the building of a number of lock dams on the Warrior River in the South. Complaint is still being made that prices on jobs being placed mean little or no profit to the successful bidders, and that in some cases work is certainly figured on less than the 1.40c. basis for plain material. We continue to quote beams and channels for shipment from maker's mills in the Pittsburgh district at 1.40c. For delivery at certain points in competition with Eastern mills, this price is sometimes slightly shaded.

Plates.—The steel car companies are taking out a fair amount of material, needed on present contracts, but practically no new orders for steel cars have been placed for some time, and November 1 will see present orders pretty well cleaned up. All the plate mills are able to make prompt shipments, and have a very limited amount of actual tonnage on their books. We quote ¼-in. and heavier plates in the wide sizes at 1.40c., Pittsburgh, while three or four plate mills in the Pittsburgh district, that make a limited range of sizes, are quoting about 1.35c., at mill.

Sheets.—This week the American Sheet & Tin Plate Company is operating 154 hot sheet mills, or about 80 per cent. of capacity. New demand for sheets is showing some betterment, but prices are still pretty badly demoralized. The decline in prices of sheet bars of about $3 a ton or more has been given away by the sheet mills to their customers in the form of lower prices on sheets, so that the mills are no better off now than when they were paying higher prices for sheet bars. Box annealed, one pass cold rolled black sheets, No. 28 gauge, are on the basis of about 2.15c. to 2.20c., and No. 28 galvanized at about 3.20c. to 3.25c. at maker's mill in carload and larger lots. Painted and galvanized corrugated sheets are also being materially shaded. Present prices in effect on black, galvanized and roofing sheets will be found on a previous page.

Tin Plate.—This week the American Sheet & Tin Plate Company is operating 202 hot tin mills, or to 86 per cent. of its capacity. Reports that it would add four new hot tin mills to its Sharon, Pa., works are untrue. All the makers of tin plate are pretty well sold up for the rest of this year, and in some cases into first quarter of next year, and specifications are coming in very freely. Prices are very firm and we quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

THE IRON AND METAL MARKETS

Bars.—New buying in both iron and steel bars is light, but specifications against contract received by the mills in August were fairly satisfactory and heavier than in July. The railroads are not placing many new orders for iron bars and the mills rolling iron bars are badly in need of tonnage. It is said that the Carnegie Steel Company will start work in a short time on its new steel bar mills to be erected at Girard, Ohio. The steel for these mills will be shipped from the Bessemer and open hearth steel plants of the company at the Ohio Works, Youngstown. We quote steel bars at 1.40c. in large lots and 1.45c. in small lots, while iron bars are ruling at about 1.45c., Pittsburgh.

Spelter.—The market continues firm and prime grades of Western are quoted to-day at about 5.20c., East St. Louis, or 5.32½c., Pittsburgh.

Hoops and Bands.—There is not much new buying in either hoops or bands, but specifications against contracts are being received by the mills at a fairly satisfactory rate. We quote hoops at 1.50c. to 1.55c. and bands at 1.40c. to 1.45c., the latter carrying extras as per the steel bar card of September 1, 1909.

Spikes.—New demand for railroad spikes from the railroads is light, and is only in small lots to cover current needs. The demand for small railroad and boat spikes is fair, but all the spike mills could take care of a good deal more business if they had it. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, in carload and larger lots.

Rivets.—There is a fair run of new orders for rivets, but mostly in small lots to cover current needs, consumers not caring to anticipate.

Shafting.—The new demand for shafting is only fair, and specifications against contracts from automobile makers and other large consumers are not as heavy as they were some time ago. Regular discounts on shafting remain at 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots, delivered in base territory. On desirable contracts and for large lots 55 and 5 per cent. is being named.

Wire Products.—Specifications against contracts for wire products received by the leading interest in August showed an increase of about 700 tons a day, as compared with July, and other makers of wire and wire nails report a very substantial increase in orders booked and sent to the mills in August over the previous month. At the same time it is true that the wire trade is not showing as heavy a volume of business as expected, consumers still being largely inclined to place orders only for small lots to cover current needs. The demand for cut nails is fair, but is mostly in small lots, jobbers and consumers not desiring to anticipate requirements. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.65, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—The order for 23 miles of 16-in. pipe for the Manufacturers' Light & Heat Company has been placed with a local interest, while the Monongahela Natural Gas Company has placed contracts for 44,000 ft. of 10-in. pipe and 7300 ft. of 12-in. The Ohio Fuel Supply Company has placed an order with a local interest for 3½ miles of 6-in. pull weight steel line pipe. It is probable that the inquiry of the Everett-Busch Syndicate, which proposes to pipe natural gas from Shreveport, La., to St. Louis, and which calls for nearly 400 miles of large pipe, will go over into next year. It is so late now that it is not desired to start work on this large project at this time. The general demand for merchant pipe is showing some betterment, and the pipe mills refer to the present condition of the pipe trade as being fairly satisfactory. Discounts on iron and steel pipe now in effect are printed on a previous page.

Boiler Tubes.—There is a fair demand for locomotive tubes from the railroads, but it is not nearly as large as the mills would like to have it. The new demand for merchant tubes is also light, and discounts on both locomotive and boiler tubes printed on a previous page are still more or less shaded.

Coke.—The new demand for both furnace and foundry coke is quiet, and no large inquiries for blast furnace coke are in the market. Several furnace interests have not yet covered their full requirements for the remainder of this year, but are buying from month to month. A contract has just been closed by the Whitney-Kemmerer Company, Oliver Building, Pittsburgh, for the entire output of the Dunlap-Connellsville Coke Company for ten months, beginning September 1. About 60,000 tons of furnace coke are involved, the output of the works being about 6000 tons per month. Prices are on a sliding scale, based on the average monthly prices of basic pig iron. The output of coke in the Upper and Lower Connellsville regions last week was 361,913 tons, a decrease over the previous week of nearly 4000 tons. Standard grades of blast furnace coke for prompt shipment are held at about $1.60 to $1.65 per net ton at oven, and about $1.75 to $1.80 on contracts for forward delivery. Best grades of 72-hour foundry coke are held at $2.15 and up to $2.50 per net ton at oven.

Iron and Steel Scrap.—There is not much improvement to note in the demand, consumers still pursuing the policy of buying only such scrap as is actually needed, not being convinced that present prices will be maintained. The embargo on scrap routed for Monessen, Pa., has been lifted. Dealers quote about as follows, per gross ton, for delivery at Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$14.25 to $14.50
No. 1 foundry cast	14.00 to 14.25
No. 2 foundry cast	13.00 to 13.25
Bundled sheet scrap, at point of shipment	10.25 to 10.75
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	15.75 to 16.00
No. 1 railroad malleable scrap	13.50 to 13.75
Grate bars	11.50 to 11.75
Low phosphorus melting stock	17.50 to 18.00
Iron car axles	24.50 to 25.00
Steel car axles	21.50 to 22.00
Locomotive axles	25.00 to 25.50
No. 1 busheling scrap	12.25 to 12.50
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.50 to 13.75
Sheet bar crop ends	16.00 to 16.25
Cast iron borings	7.75 to 8.00
Machine shop turnings	9.25 to 9.50

Chicago

FISHER BUILDING, September 7, 1910.—(*By Telegraph.*)

The differences between Illinois coal operators and miners remain unsettled at this writing. Industrial buyers of coal have become keenly interested in the situation, as screenings are so scarce that lump coal is being crushed for use in modern power plants. An indirect result of the situation will prove serious later on. The West is bare of stocks of coal, both for industrial and domestic use, and when the Illinois miners resume, after being closed since April 1, the railroads will be congested with the movement of coal which will have to be given preference over other freight. This will delay and congest the movement of industrial freight and aggravate the car shortage which is generally expected during the winter. At the present time complaints are becoming more common among shippers of delay in getting cars for loading. A similar condition prevailed in the fall of 1906 and was followed by a very severe car shortage. No important inquiries for cars have been reported from Western roads the past week and the continued absence of railroad buying is the only backward feature in the iron and steel market. Business is good in wire products, sheets, merchant steel and other lines of general consumption. Inquiries have been received, however, for standard rails for delivery this year amounting to 30,000 tons, and several roads are preparing their orders for next year for large tonnages. There is also evidence that the malleable foundries are getting more railroad business, as they are buying railroad malleable and steel scrap on a more liberal scale than for several months. The bar iron mills are also getting more liberal orders, one railroad having purchased 300 tons last week. The market for old material shows more life and prices are firmer but have not advanced to any marked extent.

Pig Iron.—The inquiry for pig iron has broadened out considerably during the past week. It would be difficult to estimate the amount of iron involved in inquiries for the first quarter and first half of 1911, but it would easily foot up 100,000 to 200,000 tons. A majority of the buyers throughout the West have begun to show keen interest in prices for 1911. Their inquiries, however, have been received coldly by the furnace interests. On both Northern and Southern iron furnaces are willing to accept business for first quarter at an advance of 50c. over the price for last quarter, but the buyers have not reached a point where they will consider paying higher prices, and there has been no actual increase in the melt or the volume of business of foundries to force action. For the time being buyers are not taking as much interest as formerly in Southern iron for prompt or early shipment. It is believed that foundries in Chicago territory are generally covered to the end of the year on Southern iron. It is estimated that stocks of iron at Southern furnaces, including warrant iron, increased since last April and amount to 300,000 tons. The refusal of furnaces to quote beyond December is explained by the argument that it may be good business policy to sell iron at cost from furnace stocks or current production, but they cannot afford to make forward contracts at prices which do

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not show a profit. The Northern furnaces in this territory have taken the same position. They claim that current prices are down to cost and they can only afford to sell on the present basis for early deliveries. There are more inquiries for Northern iron for prompt shipment, and sales last week by local furnaces were larger than the present rate of production, including a considerable tonnage of off grade and gray forge iron. A local steel plant has purchased 10,000 tons of basic for delivery this year from a furnace east of Chicago. A local sale of 2000 tons of basic is noted to a Milwaukee steel foundry. The malleable foundries in this territory are more active in purchases of iron for the remainder of the year, and also figure largely in inquiries for the first half of 1911. The following quotations are for September shipment, Chicago delivery:

Lake Superior charcoal	$18.50 to $19.00
Northern coke foundry, No. 1	17.00 to 17.50
Northern coke foundry, No. 2	16.50 to 17.00
Northern coke foundry, No. 3	16.25 to 16.50
Northern Scotch, No. 1	17.50 to 18.00
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.65 to 18.15
Jackson Co. and Kentucky silvery, 6%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%	21.40 to 21.90

(By Mail.)

Billets.—There are only occasional orders in this market, chiefly for forging billets. Ordinary lots are going at $29, base, for forging billets, Chicago, but this price could be shaded on any large tonnage.

Rails and Track Supplies.—While the railroads may not come into the market with large orders for next year until the rate inquiry is settled, there is an awakening of interest among the roads in their requirements. Inquiries are pending for about 30,000 tons of standard sections for this year's delivery and it is known that several roads have prepared estimates for their requirements for 1911. A recent purchase by one road included 9000 tons of Bessemer rails from Chicago, along with 9000 tons of ferrotitanium Bessemer rails from Lackawanna. The demand for track supplies is not so heavy as it was last spring, but the mills are still fairly well supplied with specifications. We quote standard railroad spikes at 1.70c. to 1.80c., base; track bolts with square nuts, 2.30c. to 2.40c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., $26; 30 to 35 lb., $26.75; 16, 20 and 25 lb., $27; 12 lb., $28, Chicago.

Structural Material.—The mills are getting a good run of orders for plain material, as many of the fabricators reduced their stocks during the summer and are now buying more liberally to take care of their current business. The principal business let last week was a bridge contract of the Oregon Trunk Railroad, 5100 tons, which went to the Pennsylvania Steel Company. This contract covers the Celilo bridge in Oregon and two bridges over the Des Chutes River. This is a road which the Hill interests are building in Oregon. The Chicago, Burlington & Quincy has ordered 1000 tons of bridges from the American Bridge Company. A city viaduct at Fort Dodge, Iowa, 535 tons, was let to the Indiana Bridge Company, Muncie, Ind. The Morava Construction Company has secured a 700-ton contract for the Burdick Hotel, Kalamazoo, Mich. A 300-ton contract for a coal tipple for the Bunsen Coal Company was let to the North Works of the Illinois Steel Company. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—A fair amount of new business is received from fabricating shops, but the lack of car business which runs into the heaviest tonnage makes the market somewhat weak. We quote mill prices at 1.53c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—The demand is very steady and satisfactory for jobbers' lots of open hearth sheets and there is also good buying in moderate lots by manufacturing consumers. The price situation remains practically unchanged, although there is a little better feeling in the market. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.43c.; No. 28 galvanized, 3.43c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Bars.—Specifications on yearly contracts for soft steel bars are very satisfactory and will keep the mills fully occupied this fall. The hard steel bar mills report the market quiet. The bar iron mills are doing a little better on new business, but railroad buying is generally confined to small lots for immediate shipment. We quote as follows: Soft steel bars, 1.58c. to 1.63c.; bar iron, 1.37½c. to 1.40c.; hard steel bars rolled from old rails, 1.45c. to 1.55c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—Manufacturing consumers of wire products are specifying more liberally. In the jobbing trade a stocking-up movement has been under way for some time on nails and barb wire, as well as other wire products, as stocks in the hands of jobbers and retail distributers were reduced during the summer. Crop conditions continue very favorable and the mills will have a heavy run of fall business. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—Merchant steel continues one of the strong branches of the steel industry, sustained chiefly by liberal specifications from the agricultural implement manufacturers. There is, however, a better general demand from the manufacturing and jobbing trade, and the demand from store for small lots is very satisfactory.

Cast Iron Pipe.—No large lettings were reported last week, but the leading interest received one mail order for 600 tons of water pipe and another for 400 tons. Routine orders for fall shipment are holding up well. No large inquiries have come in yet for winter and spring shipment, but the foundry interests are not anxious to book business for next year, as the iron market may improve enough to stiffen prices later on. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $27; 6 to 12 in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Old Material.—Conditions have improved considerably in the scrap market during the past week, reflecting the general improvement in business conditions. Some of the dealers are asking higher prices, but the market has been slow to follow their efforts. There are more inquiries from gray iron and malleable foundries and a considerable tonnage of cast and malleable scrap has been placed with consumers. One lot of rail crops which the owner was unable to move during the summer, amounting to 1700 tons, was sold last week at about the market price. It is evident that the larger malleable foundries which run on railroad work are either getting good contracts or expect to have more railroad business in the near future. The demand for cast scrap is also good, but dealers have not been successful in obtaining any higher prices than heretofore quoted. Melting steel is moving freely to local consumers at about $12.50 delivered. Taking the market all round, the change during the past week has been chiefly in the willingness of consumers to take whatever is offered them if dealers will sell at current prices. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$16.00 to $16.50
Old steel rails, rerolling	15.25 to 15.75
Old steel rails, less than 3 ft	13.50 to 14.00
Relaying rails, standard sections, subject to inspection	24.00 to 25.00
Old car wheels	14.00 to 14.50
Heavy melting steel scrap	12.25 to 12.75
Frogs, switches and guards, cut apart	12.25 to 12.75
Shoveling steel	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars	$14.00 to $14.50
Iron car axles	19.50 to 20.00
Steel car axles	19.50 to 20.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Springs, knuckles and couplers	11.50 to 12.00
Locomotive tires, smooth	17.00 to 17.50
No. 1 dealers' forge	10.50 to 11.00
Steel axle turnings	8.50 to 9.00
Machine shop turnings	7.00 to 7.50
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	10.00 to 10.50
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.00 to 9.50
No. 1 cast scrap	12.75 to 13.25
Stove plate and light cast scrap	11.00 to 11.50
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	9.25 to 9.75

Carl R. Briggs and Joseph H. Turivas, who have been connected with L. Bregman & Co. for the past six years, have engaged independently in the scrap business under the firm name of Briggs & Turivas, 1346 First National Bank Building, Chicago.

D. & G. Kaufman, formerly with offices in the Rookery, Chicago, have discontinued business owing to the recent death of G. Kaufman and the retirement of his brother, the senior member of the firm, from active business.

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Philadelphia

PHILADELPHIA, PA., September 6, 1910.

While the market in this territory may be stronger sympathetically, the volume of business actually transacted during the week has been small, both in crude and finished materials. There are still a number of fairly good inquiries pending, but consumers are pursuing a waiting policy, hoping for price concessions. Producers, however, present if anything a somewhat stronger front on the price question, particularly for pig iron and some classes of finished materials, and offers under current quotations have been generally turned down. Deliveries on crude material contracts are being freely taken, and producers continue to operate on the same average basis as for the last month. In finished materials, particularly plates and shapes, contracts could be entered for fair sized lots, but makers refuse, as a rule, to accept business for delivery before the year end. Steel billets are a trifle easier, with current business small. A better demand for sheets is reported, but prices are lower and concessions for tonnage available. The refined iron bar market continues dull and there has been very little movement in old materials.

Iron Ore.—Statistics available show the importation of iron at the port of Philadelphia during the first 30 days of August to have been 114,298 tons, valued at $342,067. This is quite a falling off as compared with the month of July, when importations reached 154,953 tons, valued at $514,041. A classification of the July importations shows 54,304 tons arriving from Mediterranean, 32,358 tons from Newfoundland, 48,336 tons from Swedish and 20,000 tons from Cuban ports. The movement in foreign ore shows a decrease, owing to the successful efforts, in some cases, on the part of consumers to have shipments deferred, and it is anticipated that, for a time at least, importations will continue to fall off. Practically no new business has been done in the ore market. The majority of consumers are oversupplied as far as this year's requirements are concerned. Efforts to have shipments of lake ores deferred have not been so successful as they have been in foreign ores. No fresh purchases of lake ores have been made, consumers anticipating a reduction in price about the first of the year. Foreign charters are practically stationary, ranging from 9s. to 9s. 3d. from the south of Spain.

Pig Iron.—Buyers appear to be in no haste to make purchases, and transactions during the week have again been comparatively light. The majority of the sales have been in the foundry grades, but transactions are still confined to small lots for near future delivery. There is, however, a little more firmness in prices, and while consumers have endeavored to place business at less than $16, delivered, for standard brands of No. 2 X foundry iron, they have, as far as can be learned, been unsuccessful in their efforts. In fact, some sellers have refused to accept orders at $16.25, delivered. No effort is made by producers to force business at the present range of the market, nor will they accept orders on which the delivery extends beyond the year end. With both buyers and sellers pursuing a waiting policy, the market shows little signs of immediate activity, although there is a general feeling that it will not be very long until buyers take hold more aggressively. Sales of foundry grades are small individually; occasionally a lot of several hundred tons is taken, but the bulk of the business runs from carloads to 100-ton lots. Some producers have taken a few orders covering fair lots for New England delivery. The cast iron pipe makers are still holding out for lower prices, their idea being about $14.50, delivered, for foundry forge, but sellers have not yet met their views, although they are probably not holding quite as firmly the recent $15 level for forge iron. Small lots have been picked up by the pipe foundries, but no heavy transactions are reported. There has been little movement in Virginia foundry grades, small sales for early delivery being made at unchanged prices. There has been a little business done in the steel making grades, a purchase of 5000 tons of basic iron by an Eastern mill, for November-December delivery, being reported at $15, delivered, which flatly represents the market. An inquiry for about 2500 tons for early delivery from another Eastern consumer is also before the trade. Low phosphorus iron has been sold in small lots at $22.50, delivered in this vicinity. One transaction, involving about 1000 tons, is heard of, but lacks confirmation. A little betterment in the demand for forge iron is noted, a sale of between 2000 and 3000 tons for rolling mill purposes, as well as several smaller lots, having been made at equal to $14.75 to $15, delivered in buyers' yards in this immediate vicinity. No change is noted in the general range of prices except for forge iron, which is a shade lower. The range of quotations for standard brands delivered in buyers' yards in this vicinity during the remainder of the year is as follows:

Eastern Pennsylvania, No. 2 X foundry	$16.00 to $16.25
Eastern Pennsylvania, No. 2 plain	15.75 to 16.00
Virginia, No. 2 X	16.00 to 16.50
Virginia, No. 2 plain	16.00 to 16.25
Gray forge	14.75 to 15.00
Basic	15.00
Standard low phosphorus	22.50 to 22.75

Ferromanganese.—The market is at a standstill. No inquiry beyond a few small lots from Western consumers is reported. Prices are largely nominal, at $39 to $40, Baltimore.

Billets.—Consumers appear to be content to buy in small quantities for near future requirements, and current business in rolling billets has been rather light, although specifications on old orders continue to come out freely and keep mills comfortably busy. There is, however, a little improvement in the demand for forging billets. Prices are easier. Ordinary lots of standard open hearth rolling billets are quoted at $27, delivered in this territory, and for attractive specifications could possibly be shaded. Forging billets are firm at $29, Eastern mill, as the minimum price, the usual extras applying for high carbons and special sizes.

Plates.—The demand is not very active. Consumers would contract for their supplies for the remainder of the year, but mills, as a rule, are not particularly anxious to enter business of that character, preferring to take small miscellaneous orders, such as have been placed here of late. There seems to be a stronger feeling in connection with prices, not that any immediate advance is likely, but there is evidently less disposition on the part of the Eastern mills to make concessions from 1.55c., delivered in this territory, for the general run of business. A few large tonnages are in sight, but the bulk of the business around is of a miscellaneous character. Specifications on old orders are reported as coming out quite freely.

Structural Material.—A very satisfactory run of miscellaneous business is reported, but the majority of the propositions running into any tonnage are still held up. One hotel addition covering some 700 tons has been closed, together with several smaller buildings. A moderate amount of bridge work, outside of that for the Quebec Bridge, is pending. Prices are unchanged and mills appear to be a trifle firmer in their views on prices for plain shapes, the minimum quotation for which remains at 1.55c., delivered in this vicinity.

Sheets.—Business is still quite irregular. Orders are largely for small lots for prompt delivery, and prices are a shade easier. Some mills are still fully engaged, while others are less active, but few have any tonnage for forward delivery on their books. For ordinary prompt business prices are a tenth less than recently quoted, and further concessions would, no doubt, be made for desirable specifications. Quotations of Eastern manufacturers range as follows for small, prompt lots: Nos. 18 to 20, 2.60c.; Nos. 22 to 24, 2.70c.; Nos. 25 and 26, 2.80c.; No. 27, 2.90c.; No. 28, 3c.

Bars.—The demand has again become lighter, business offered in refined iron bars being in small lots, on which makers show little inclination to shade quotations. Prices, therefore, are unchanged, at 1.40c., minimum, for refined iron bars, delivered in this vicinity, although a concession of one or two hundredths might be made for desirable orders. Steel bars are in fair demand, at 1.55c. to 1.60c., delivered in this territory.

Coke.—Little movement in either foundry or furnace coke is to be noted. A few contracts for moderate lots of foundry coke at $2.25 to $2.50 per net ton, at ovens, are reported, but the tonnage has in no case been large. Furnace coke for forward delivery is quiet at $1.65 to $1.75. One transaction covering several thousand tons of Connellsville furnace coke for September delivery is, however, reported at $1.55. Prices, as a rule, are unchanged and firmly maintained, the following range representing quotations per net ton, delivered in buyers' yards in this territory:

Connellsville furnace coke	$4.00 to $4.15
Foundry coke	4.50 to 4.75
Mountain furnace coke	3.60 to 3.75
Foundry coke	4.10 to 4.35

Old Material.—There has been little movement in any grade. The market is stronger sentimentally, but prices are unchanged. No. 1 railroad wrought has been sold at $16.25, delivered, although the leading purchaser does not offer over $15.50, delivered. No. 1 heavy melting steel is being shipped more freely to Eastern steel mills, but these deliveries apply largely on old, high priced contracts. Transactions in other grades have been light and, in some, insufficient to establish a market. The following range about represents bids and offers for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

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No. 1 steel scrap and crops	$13.75 to $14.00
Old steel rails, reroiling	15.50 to 16.00
Low phosphorus	19.00 to 19.50
Old steel axles	20.00 to 20.50*
Old iron axles	26.50 to 27.50*
Old iron rails	18.00 to 18.50
Old car wheels	13.75 to 14.25
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	13.50 to 14.00
No. 1 forge fire	12.00 to 12.50
No. 2 light iron	7.50 to 8.00
Wrought turnings	8.75 to 9.25
Cast borings	9.25 to 9.75
Machinery cast	14.00 to 14.50
Railroad malleable	13.50 to 14.00
Grate bars	11.50 to 12.00
Stove plate	10.00 to 10.50

* Nominal.

Cleveland

CLEVELAND, OHIO, September 6, 1910.

Iron Ore.—All of the wild carriers under contract with the Pittsburgh Steamship Company will get their last cargoes for the season during September, so that the movement down the lakes will fall off heavily after the first of next month, and more boats will be forced to go out of commission. In view of an early closing of navigation other ore interests are getting their ore down as rapidly as possible, and it is expected that the tonnage to be shipped after November 1 will be very light. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Ore shipments for August were 6,964,381 tons, making the total movement until September 1 28,829,029 tons. This is a gain of 6,238,480 tons over the same period of last year.

Pig Iron.—The market continues fairly active. While there are not so many large inquiries as during the previous two weeks, there is considerable inquiry for small lots of foundry iron, a good share of which is coming from this immediate territory. The larger part of the inquiry is for iron for delivery after January 1, but many of the buyers also want iron for the fourth quarter. Several of the furnace interests are as yet refusing to quote prices for delivery after the first of the year. The usual quotation by furnaces willing to sell for delivery after January 1 is $14.50, Valley furnace, for No. 2, or 50 cents above last half prices, but this price can probably be shaded by a buyer who wants iron for delivery extending through the fourth quarter and into the first half. We note the following sales of foundry grades: Two 1000-ton lots to local consumer, one of Northern iron for early delivery and the other of Southern for the last and first quarter; 500 tons of northern to a local foundry for the fourth quarter; 500 tons of Northern in north central Ohio for the fourth quarter; 1500 tons of Northern and Southern to a central Ohio pump manufacturer for the first half and 1000 tons of Southern to a manufacturer of plumbers' supplies in the Pittsburgh territory for the fourth quarter. A leading implement manufacturer has an inquiry out for 2000 tons of No. 2 and 2000 tons of low grade iron for delivery at its Ohio plant through the last quarter and possibly extending into the first half, and several other inquiries for lots of 500 tons and under are pending. Southern foundry No. 2 is quoted at $11 to $11.50, Birmingham, for prompt shipment and $11.50 for the first half, but the Alabama furnaces generally appear to be unwilling to quote prices for the first half. For prompt shipment and for the remainder of the year we quote, delivered, Cleveland, as follows:

Bessemer	$15.90 to $16.15
Northern foundry, No. 1	15.00 to 15.50
Northern foundry, No. 2	14.50 to 14.75
Northern foundry, No. 3	14.00 to 14.50
Gray forge	14.15 to 14.25
Southern foundry, No. 2	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon	19.25 to 19.50

Coke.—Some additional contracts for foundry coke for delivery until July 1, 1911, have been closed, but the market is not active. Consumers are well covered for their requirements for the remainder of the year. Prices on foundry grades are firm. The furnace coke market is inactive. We quote standard Connellsville furnace coke at $1.60 to $1.75 per net ton, at oven, for spot shipment, and $1.75 to $1.85 on contract. Connellsville 72-hour foundry coke is held at $2.15 to $2.25 per net ton, at oven, for prompt shipment and $2.25 to $2.50 on contract.

Finished Iron and Steel.—The contract for the new plant to be erected by the Cleveland Electric Illuminating Company, requiring 3100 tons of steel, has been placed with T. H. Brooks & Co., Cleveland. The contract for the plain material will probably be placed within the next two or three weeks. No other structural work of any size is at present pending here. General conditions in finished lines remain practically unchanged. No inquiries for large lots of material are coming out. Specifications on contracts are fairly good and a moderate volume of orders is coming out, but they are for small tonnages, so that the market can be said to be generally quiet. Steel bars are firm at 1.40c., Pittsburgh, and with the exception of some shading on plates by mills making the narrower sizes, the 1.40c. price on plates and structural material is being firmly maintained. Manufacturers are generally fairly busy, but those not covered by contracts are buying only for their immediate needs. The demand for iron bars continues light, but the local mills are getting enough orders to keep running. Prices remain stationary at 1.35c. to 1.40c., at mill. The demand for sheets is still light and the usual concessions on prices are being made. We quote black sheets at 2.20c. and galvanized at 3.20c. to 3.25c. for No. 28. Jobbers report a fair volume of warehouse orders.

Old Material.—After continued dullness lasting for many weeks, the market now shows a little activity and dealers are hopeful of a further improvement. Local mills were in the market during the week and their purchases aggregated quite fair tonnages. A firmer feeling has resulted among dealers, but business has not been sufficient to cause any general advance in prices. Dealers are buying some material for stock, but say that not much scrap is being offered them. The Erie and Hocking Valley railroads closed on small lists September 6. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$14.00 to $14.50
Old iron rails	16.00 to 16.50
Steel car axles	20.00 to 20.50
Heavy melting steel	13.25 to 13.50
Old car wheels	14.00 to 14.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	12.00 to 12.50
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland

Iron car axles	$21.00 to $21.50
Cast borings	5.00 to 5.50
Iron and steel turnings and drillings	6.50 to 7.00
Steel axle turnings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 cast	11.50 to 12.00
Stove plate	10.50 to 11.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, September 7, 1910.—(*By Telegraph.*)

Pig Iron.—The majority of orders received the past few days were for amounts ranging from 100 to 500 tons, and while the books of some interests showed up reasonably satisfactorily others did not fare so well. The Dayton, Ohio, firm mentioned last week placed an order for 1500 tons of Southern iron, divided into three different grades, and it is understood the market price was paid, but delivery for some of this iron extends into next year. A purchase of a small quantity of Northern foundry is yet to be made by this same melter. A southern Indiana company is asking for prices on 2000 tons of foundry iron and there are two fair-sized Michigan inquiries being worked on. The purchases of the leading cast iron pipe interest during the past few days are understood to have been heavy, but local offices did not receive any large tonnage from this source. There is much difference of opinion as to next year's prices and it is generally understood that no quotable figures have yet been named for Southern irons. Prominent interests are holding Northern No. 2 foundry at $15, Ironton, for first half delivery and it is rumored that an offer below this would be acceptable to some furnaces for first quarter shipment. However, the furnaces both in the Northern and Southern districts appear indifferent, as they feel confident there will be a betterment in prices some time soon. For shipment the remainder of the year No. 2 Southern foundry is quoted at $11.50, but some Tennessee furnaces are accepting business at $11, Birmingham basis. Northern irons are held at $14.50 to $15, Ironton. Only small quantities of malleable are changing hands and $14.75 seems to be the prevailing market figure. The fair amount of inquiry coming in is encouraging, but the market is still a waiting one. The St. Louis inquiry for 20,000 tons basic is withdrawn. For immediate delivery and for the remainder of the year, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.50 to 14.00
Ohio silvery, 8 per cent. silicon	19.20
Lake Superior coke, No. 1	16.20 to 16.70
Lake Superior coke, No. 2	15.70 to 16.20
Lake Superior coke, No. 3	15.20 to 15.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	22.25 to 22.75

Coke.—An Eastern consumer has just closed contract with a local firm for a quantity of furnace coke, deliveries running into the third quarter of next year. The tonnage

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involved makes this the largest sale consummated here for several months.

(*By Mail.*)

Coke.—A little better inquiry for small lots of foundry coke is to be noted this week. Furnace coke continues a slow seller so far as new contracts are concerned, and while the spot shipment price is a little better for some brands, some operators are understood to be willing to fill orders at a figure below market quotations. The average contract price for Connellsville, Wise County and Pocahontas furnace coke is $1.75 per net ton, at oven, and for the last named field it is emphatically denied that any better figure for future shipment is obtainable. Connellsville 72-hour foundry coke is held around $2 to $2.10 for prompt shipment, with a 10c. to 15c. advance ruling for contracts. The leading grades of Pocahontas and Wise County foundry are about on the same level.

Finished Iron and Steel.—The demand for structural material and steel bars appears to be better. Considerable business was booked last week, if the past few weeks previous can be taken as a standard. Dealers having stocks on hand, proportionately speaking, fared better than the mills. Hoops and bands were also good sellers during the past few days. The warehouse price of steel bars is 1.80c. and that of structural material 1.90c. to 2c. The mill base price on hoops and bands is 1.55c., and it is stated that this figure is generally maintained.

Old Material.—Some small lots of scrap are being picked up by local dealers, and quantities of corresponding size are absorbed by the foundry interests, but no large tonnages are changing hands. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton	$12.50 to $13.00
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 7.00
No. 1 cast scrap, net ton	11.50 to 12.50
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old steel rails, gross ton	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	12.00 to 12.50

Birmingham

BIRMINGHAM, ALA., September 5, 1910.

Pig Iron.—Aside from the larger inquiry the past week, the chief item of interest to the iron trade of the Birmingham district has been the large inroad on furnace stocks. There has been a larger movement the past month of warrant iron, as well as other stocks, and a careful summary of stocks on hand September 1 shows a reduction in Alabama to the extent of over 60,000 tons. This is so great a reduction that the figures are being carefully gone over again to-day, but there is not the least doubt that stocks on furnace yards have shown a very material shrinkage for the month just closed. July showed some reduction, and with this heavy inroad on stocks for August, and with the unusually large inquiry for the first few days in September, sellers of iron here feel decidedly more optimistic than for several months. It is true that iron sold in some instances at $11, Birmingham, for No. 2, but it is doubtful if one could secure any tonnage of consequence at that figure to-day, especially for forward delivery. Practically all interests are declining to quote for 1911 delivery, while $11.50 seems to be the well-established figure for the remainder of 1910. The high grades of well-known brands are now very scarce, and some special irons, where the phosphorus is low for Southern iron, with high manganese, are bringing quite a fancy premium for even the lowest grades. Of course, these special irons are sold almost exclusively by analysis, and $12.50 is easily obtainable for lower grades running down to 1 per cent. in silicon. No additions have been made to the production the week past, although another stack will doubtless be added this week.

Coal and Coke.—The demand for coal continues excellent; in fact, the Alabama coal operators have had a better trade on coal this summer than for the past three years, due to strikes in the Western and Southwestern fields and to the fact that not so much is coming down the Mississippi River as in former years. Contracts are being placed now for a great deal of foundry coke, while there is shown a better tone to the market for furnace coke.

Cast Iron Pipe.—The manufacturers of cast iron pipe, both small and large sizes, express a more hopeful feeling, though, perhaps, more or less in sympathy with the pulse of the iron makers. All the local plants are comfortably filled with orders for some 60 to 90 days, and while contracts on the books at this time, perhaps, show no appreciable margin of profit, yet the managers of sales feel confident that, with improved buying in all iron and steel lines, better prices must soon prevail. The crops of the country at large appear to be a good average in all directions and will bring good prices. The pipe people, therefore, expect that a little later on there will be a vast number of lettings on the part of the smaller municipalities that are to a large extent dependent upon the success or failure of the crops—especially through the Central West and Southwest—while the South is doing more in that line to-day than ever before. We quote water pipe, per net ton, f.o.b. cars here, as follows: 4 to 6 in., $22.50; 8 to 12 in., $21.50; over 12-in., $20.50. Gas pipe, $1 per ton higher.

Old Material.—The scrap iron people are a bit slow to feel any improvement, as the movement continues rather light. Quotations are still nominal and are about as follows:

Old iron axles	$15.50 to $16.00
Old iron rails	13.50 to 14.00
Old steel axles	15.00 to 15.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	10.00 to 10.50
No. 1 steel	12.00 to 12.50
Tram car wheels	10.00 to 10.50
Standard car wheels	11.00 to 11.50
Light gas and stove plate	8.50 to 9.00

One of the Sloss City furnaces is expected to go in blast this week.

The Central Iron & Coal Company has practically completed repairs to its stack at Holt, Ala., and it will doubtless be lighted about October 1.

The work of overhauling one of the two Woodstock furnaces at Anniston is progressing favorably, and it is the purpose of the Anniston Iron Corporation to put this one furnace in operation during October.

St. Louis

ST. LOUIS, September 5, 1910.

The volume of general business continues large, as evidenced by the bank clearings for St. Louis for the month of August, which show an increase of nearly $17,000,000 over the clearings for the same month last year. The feeling in the iron market is somewhat better, there being more disposition to regard prices as steady and a more active demand is now pending.

Coke.—With most of the leading sales agencies business in coke the past week was quiet, the inquiry and sales being of very moderate proportions. There was one sale of a large lot for delivery into this territory which will be reported at another center. The sale of 1000 tons of foundry coke, for shipment over the remainder of the year, is reported. Prices are ruling steady and firm. We quote standard Connellsville 72-hour foundry at $2.25 to $2.35 per net ton, at oven, for prompt and contract shipment; Virginia coke $2.25 per net ton, f.o.b. oven; carloads 25c. per ton higher.

Pig Iron.—A leading house reports the following sales: 1000 tons Southern iron to an outside foundry for spot delivery; 500 tons for shipment over the last quarter; 500 tons for shipment over the first quarter 1911; 450 tons for September-October delivery; 300 tons high silicon iron for shipment over the remainder of the year. Another leading sales agency reports an inquiry from a local steel foundry for 5000 tons basic for shipment over the first quarter 1911; also an inquiry for 500 tons No. 2 Southern for early shipment. The sale of 600 tons No. 2 Southern to a local steel foundry for shipment over the first quarter 1911 was divided between two offices. An inquiry is reported by a third broker for 1000 tons No. 2 Southern, shipment over the first quarter 1911. Merchant sellers report new business dull, but are shipping freely on prior sales. Speaking of the market as a whole the feeling has improved, and a more active demand is confidently looked for from now on, but with respect to prices, the most that is expected is the maintenance of present quotations. There is some irregularity in prices for Southern foundry, depending on brands for delivery and with respect to iron for 1911, only a limited number of furnaces are willing to name prices. We quote No. 2 Southern foundry for shipment over the remainder of the year at $11, though some brands are held at $11.50; for shipment over the first half 1911, some furnaces name $11.50, f.o.b. Birmingham basis. Ohio foundry and malleable irons are quoted at $14.50 to $15, f.o.b. furnace. The demand for malleable iron is quite small.

Finished Iron and Steel.—The demand for standard rails is limited; for light rails there is a fair demand from coal interests, in view of the prospect of the settlement of the strike, and also some inquiry from lumber people. For structural material only a moderate business is doing. From manufacturers and jobbers there is a fair amount of inquiry for bars. In track material a steady but moderate demand is reported by the leading interest.

THE IRON AND METAL MARKETS

Old Material.—It is still a dealers' market in scrap iron and steel, with only a moderate volume of trade. The following railroad offerings are reported: Missouri Pacific, about 1500 tons; Wabash, 500 tons; St. Louis & San Francisco, 350 tons. Light sections relaying rails are in good request from lumber interests. For the general list no material improvement in the demand is looked for at present. Prices on steel scrap are not quite as strong as last week. We quote dealers' prices as follows, per ton, f.o.b. St. Louis:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	14.25 to 14.75
Old steel rails, less than 3 ft.	12.75 to 13.25
Relaying rails, standard sections, subject to inspection	24.50 to 25.00
Old car wheels	14.25 to 14.75
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.25 to 12.75

The following quotations are per net ton:

Iron fish plates	$14.25 to $14.50
Iron car axles	19.00 to 19.50
Steel car axles	19.00 to 19.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	11.00 to 11.50
Railway springs	11.00 to 11.50
Locomotive tires, smooth	16.50 to 17.00
No. 1 dealers' forge	11.00 to 11.50
Mixed borings	5.00 to 5.50
No. 1 busheling	10.50 to 11.00
No. 1 boiler, cut to sheets and rings	9.50 to 10.00
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	9.50 to 10.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.50 to 9.00
Machine shop turnings	8.00 to 8.50

Statistics compiled by the officials of the railroads indicate that nearly $70,000,000 has been appropriated in the last five years for terminal improvements in St. Louis.

The investments in electric railroads in the St. Louis district, in Missouri and in Illinois, now aggregate $142,066,000. The length of the lines is about 735 miles.

Buffalo

BUFFALO, N. Y., September 6, 1910.

Pig Iron.—The outlook is slightly more encouraging from the producers' point of view, there being a perceptible increase in inquiry both for last quarter and first half. Present conditions are still far from satisfactory, however, as a majority of consumers continue the hand to mouth policy in buying, and furnace interests are averse to considering present prices, which are down to the limit, for next year's delivery, and most of them are refusing to quote for extended deliveries. One interest reports sales aggregating 6000 tons for the week, principally foundry grades, and all for delivery within the next three months. Another reports two orders of 2000 tons each and one for 1000 tons of No. 2 X and No. 3 foundry. Also quite a number running from 500 to 100 tons and carload lots coming from implement, cast iron pipe and stove makers, for delivery over the last half. A company at Medina, which has been in the market for 1500 tons of foundry grades for soil pipe manufacture, is reported to have purchased. A New England concern has had inquiries out for 5000 tons of basic, but has not yet placed order in this district. Shipments on contracts are very heavy. Prices remain practically the same as for last week, although in some instances a shade harder for small orders. We quote as follows, f.o.b. Buffalo:

No. 1 X foundry	$15.00 to $15.50
No. 2 X foundry	14.50 to 15.00
No. 2 plain	14.25 to 14.75
No. 3 foundry	14.00 to 14.50
Gray forge	14.00 to 14.25
Malleable	14.75 to 15.25
Basic	15.25 to 15.75
Charcoal	18.75 to 19.25

Finished Iron and Steel.—The general situation is promising and indications that purchases are coming into the market for their fall requirements are more pronounced. New business in all lines keeps up in fairly satisfactory volume, with wire products leading. The inquiry for sheets is better, and tin plate continues to be a strong feature. In steel bars a larger proportion of orders are being taken at 1.45c., Pittsburgh, and some interests are not contracting even at this price beyond January 1. There is a good demand for sheet piling in small lots for work to be finished up before winter sets in. The Canadian export demand for bar products from agricultural implement and carriage makers is also good. In structural material the demand is running in fairly satisfactory volume, and specifications for a number of new building projects are soon to come out, including the Jerome Hotel at Erie, Pa., which will call for about 800 tons of steel. Bids will soon be received for structural steel for a theater and office building, to be erected at Syracuse by the Keith Theater Syndicate, and for a wholesale grocery warehouse at Binghamton, each of which will require a good tonnage. The Buffalo Structural Steel Company was low bidder for the fabrication and erection of the steel for the Utica Hotel, Utica, N. Y., 1230 tons, but the contract has not yet been awarded. The Syracuse Bridge Company has received contract for the fabrication and erection of the steel, about 1000 tons, for the theater and office building to be erected at Syracuse for W. Snowden Smith. Plans for the Buffalo Tuberculosis Hospital and for the Y. M. C. A. building, Erie, Pa., are to be revised and new bids called for.

Old Material.—Quiet conditions and slack demand continue and only a small amount of business is being transacted. Dealers are, however, anticipating an improvement in demand in the near future. Prices remain about the same as a week ago. We quote as follows per gross ton f.o.b. Buffalo:

Heavy melting steel	$12.75 to $13.25
Low phosphorus steel	17.00 to 17.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.25 to 13.50
Old steel axles	17.50 to 18.00
Old iron axles	22.00 to 22.50
Old car wheels	13.50 to 14.00
Railroad malleable	13.00 to 13.50
Boiler plate	10.75 to 11.25
Locomotive grate bars	10.50 to 11.00
Pipe	10.50 to 11.00
Wrought iron and soft steel turnings	6.50 to 7.00
Clean cast borings	5.50 to 6.00
No. 1 busheling scrap	11.75 to 12.00

The Rogers-Brown Iron Company has filed plans with the Bureau of Buildings, Buffalo, for the cast houses, engine house, boiler house and hoist houses and for stacks for the two blast furnaces which it is adding to the blast furnace plant at South Buffalo that it recently took over from the Buffalo & Susquehanna Iron Company. Construction work on the new furnaces and buildings is well under way.

New York

NEW YORK, September 7, 1910.

Pig Iron.—The buying in the past week in Eastern markets has been chiefly by pipe works, both manufacturers of soil pipe and of gas and water pipe. The inquiries by a large manufacturer of soil pipe amounted to over 31,000 tons, shipment being called for over the remainder of this year and the first quarter of next year. Nothing has been done in this case on iron for 1911, but the purchases for this year are believed to exceed 7500 tons, being largely No. 3 and No. 4 iron. An Eastern Pennsylvania pipe works has bought 2000 to 2500 tons of No. 3 and gray forge iron for delivery this year. On the soil pipe iron referred to above some low prices came out, the statements of sellers being to the effect that odd lots were moved on which for one reason and another they were willing to go below recently prevailing prices. At Buffalo, for example, some iron running 1.75 to 2 per cent. in silicon was sold at 75c. below the common price for iron classed as No. 2. Foundries have not been in the market in this district and in New England to any extent since the sale of 2500 tons made recently at Worcester, Mass. Where deliveries for next year have been called for furnaces have been quoting 50c. to $1 a ton above current prices. It is believed quite a little buying for 1911 will develop before the end of this month. Quotations are as follows, at tidewater: Northern No. 1 foundry, $16 to $16.25; No. 2 X, $15.50 to $15.75; No. 2 plain, $15.25 to $15.50. Southern No. 1 foundry, $15.75 to $16; No. 2, $15.25 to $15.75

Ferroalloys.—There is a fair demand for ferromanganese, and prices seem to have strengthened. The price at seaboard is now $39.50. Consumers seem to have supplied their wants in ferrosilicon, and inquiries are light; it is being held at $56, seaboard. There is talk of a syndicate being formed by parties interested in ferrosilicon abroad, and if it materializes prices are very likely to be advanced.

Finished Iron and Steel.—A little further gradual improvement in these lines is evident, but still mainly in the shape of inquiries. This, however, is having its effect in stiffening prices. Among the larger matters pending in structural materials are 1000 tons of bridge work in connection with the station of the Commonwealth-Edison Company, Chicago; the Masonic Temple in San Francisco, which will require 1500 tons; the Leary Building in Seattle, 1000 tons; an addition to the Marshall-Field wholesale store, Chicago, 900 tons; a coal handling plant in Birmingham, 1600 tons; a three-span double track bridge, 500 tons, for the New York, New Haven & Hartford, and a four-span double track bridge for the Lehigh Valley. Bids closed September 6 for a steel and concrete substation for the New York Edison Company which will require about 400 tons.

THE IRON AND METAL MARKETS

Bids will close September 12 on the steel work for what is known as area N-32 of the suburban station of the Grand Central terminal, requiring 1000 to 1200 tons. The Philadelphia & Reading is expected to come into the market shortly for about 1500 tons for work at Philadelphia. Among contracts closed are 400 tons for the Cincinanti, Hamilton & Dayton, taken by the American Bridge Company; 800 tons for the Missouri Pacific, taken by the Virginia Bridge & Iron Company; 1500 tons for the Southern Pacific at Houston, Texas, taken by the Noelke-Richards Company; and 850 tons for the annex of the St. James Hotel, Philadelphia, taken by the Eastern Steel Company. From the foregoing contracts pending and closed it is apparent that the railroads are showing a disposition to take a more active part than they have for some time. Conditions in the plate trade are practically unchanged. One large contract pending in the East is that for the Sebago pipe line for the Portland, Me., water supply. Bids will be opened September 12 for 6300 tons of 48-in. steel pipe, either lock bar or riveted, requiring ¼, 5-16 and ⅜ in. plates, 92½ to 93 in. by 160 in. The remainder of the line, about 12,000 tons, will be cast iron pipe. Specifications are better on steel bars. On account of the holidays it is difficult to compare present conditions in the bar iron market with those a week ago, but on the average orders are apparently unchanged in volume. No changes in prices are reported, plain structural material, plates and steel bars being quoted at 1.56c. to 1.61c. and bar iron at 1.45c. to 1.50c., all New York.

Cast Iron Pipe.—Interest is now centering on the opening of bids at Portland, Me., next Monday, when the pipe will be selected for the large contract then to be placed. The city of New York rejected the bids on 900 tons of water pipe submitted August 24 and a reletting has been advertised for September 14. These are the most important lettings now coming up in the East. The general demand is exceedingly light. The nominal prices of carload lots of 6-in. are still $23.50 to $24 per net ton, tidewater.

Old Material.—The situation has slightly improved. It would seem that the lowest level of prices for this period of inactivity has been touched, and values are again tending upward, even though almost imperceptibly in some lines. Heavy melting steel scrap is in better demand, and though this may be attributed to covering by dealers who sold short some time ago there is, nevertheless, a better call from steel companies in eastern Pennsylvania whose stocks are running low. It is stated that good selected steel scrap is in scanty local supply. Other kinds of old material that are somewhat scarce and are wanted are car and locomotive tires, iron axles, No. 1 railroad wrought, cast borings and malleable scrap. Very little material can now be had at any of the quotations made last week. Dealers' quotations, per gross ton, New York and vicinity, as revised, are as follows:

Rerolling rails	$12.50 to $13.00
Old girder and T rails for melting	12.00 to 12.50
Heavy melting steel scrap	12.00 to 12.50
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	22.00 to 22.50
Old steel car axles	17.00 to 17.50
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	12.75 to 13.25
No. 1 yard wrought, short	11.75 to 12.25
Light iron	5.00 to 5.50
Cast borings	6.50 to 7.00
Wrought turnings	6.50 to 7.00
Wrought pipe	11.00 to 11.50
Old car wheels	12.50 to 13.00
No. 1 heavy cast, broken up	12.50 to 13.00
Stove plate	9.50 to 10.00
Locomotive grate bars	9.50 to 10.00
Malleable cast	12.50 to 13.00

Metal Market

NEW YORK, September 7, 1910.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
Sept.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
1	12.87½	12.62½	35.70	4.40	4.30	5.35	5.20
2	12.87½	12.62½	35.40	4.40	4.30	5.40	5.25
3	12.87½	12.62½	....	4.40	4.30	5.40	5.25
6	12.87½	12.62½	35.95	4.40	4.30	5.40	5.25
7	12.87½	12.62½	36.20	4.40	4.30	5.40	5.25

The tin market is following fluctuations in the copper market very closely and pig tin went to 36.40c. this morning. Copper is being held firmly, but there is not much trading. Lead is active and hardening in price. Spelter has advanced 5 points.

Copper.—The copper market is in very good shape, and if the report of the Producers' Association, which is due tomorrow, is encouraging an advance in price is likely to result. Consumers are apparently waiting for the report, as they show but little disposition to buy. Many sellers of lake copper are refusing to let their stocks go at less than 13c., but the persistent action on the part of one leading seller in offering the metal at 12.87½c. is keeping the market at that figure. Electrolytic copper is selling at 12.62½c., and some dealers are asking 12.75c. According to figures compiled by C. Mayer, secretary of the New York Metal Exchange, the exports of copper during August were exceptionally good, but the total exports for the eight months of this year show a decrease of 25,224 tons, as compared with the same period of last year. The exports continued good during the first six days of September, amounting to 4295 tons. The London market closed to-day with spot copper selling at £55 11s. 3d. and futures at £56 6s. 3d. The day's sales amounted to 200 tons of spot and 300 tons of futures. The market was quiet.

Waterbury Average.—The Waterbury average for August was 12.75c. The average price of lake copper in New York for August was 12.93¾c. and the average price of electrolytic was 12.59⅜c.

Pig Tin.—The London pig tin market reacted a little during the latter part of last week, but since last Friday it has advanced £5. This morning's cable shows an advance of £2 over yesterday's price, and the New York market was immediately raised to 36.40c., which is the highest price that has been paid for pig tin in this market within the last three years. While stocks are not any too plentiful here there is a comfortable supply of pig tin on hand and consumers seem to be well stocked up, as they are doing very little buying. Most of the business done in this market was between dealers, and the market has assumed a speculative tone, which has resulted in New York prices following the fluctuations in London very closely. The pig tin statistics for August show that the deliveries into consumption for the first eight months of the year were 4300 tons more than in the same period of 1909. Shipments from the Straits for August were 967 tons larger than the same month of last year, but shipments for the first eight months show a decrease of 1571 tons, as compared with the same period of last year. An indication of the scarcity of available tin is contained in the fact that the visible supply on August 31 was 1239 tons below that of August 31, 1909. Pig tin was sold in New York this afternoon for 36.20c. The London market closed to-day with spot tin selling at £166 and futures at £157 12s. 6d. The day's sales amounted to 220 tons of spot and 370 tons of futures. The market was rather dull.

Tin Plates.—There is a good movement in tin plates, and an especially good demand exists for foreign tin plates. The price of tin plates at Swansea, Wales, was advanced to 14c. this morning, which is a raise in price of 3d. The advance is caused by the unusually high price of pig tin in the English market. The price for 100-lb. coke plates in New York it $3.84.

Lead.—Outside sellers of lead who have been offering the metal at 4.40c., which is the same price asked by the leading interest, have advanced their quotations to 4.45c. This is due to the fact that there is a rather good call for lead, and if anything in the way of a buying movement develops it is thought that quotations will be advanced all along the line. The metal is still relatively higher in St. Louis than in New York, and 4.30c. is demanded for it in the St. Louis market.

Spelter.—Spelter has advanced five points, and it is thought in some quarters that the prce may go still higher. Producers of spelter show little disposition to sell at the existing price, and some manufacturers have actually refused to make sales at the current quotations. The price of zinc ores is being very firmly maintained, and it is apparent that producers intend to hold back their supplies until the expected fall demand develops. Consumers are replenishing their depleted stocks by buying in small quantities. Stocks of spelter in New York are still scarce, but there is plenty of it held on board cars at East St. Louis ready for shipment. For some reason New York for the time being has ceased to be a shipping point.

Antimony.—Buyers are neglecting the antimony market, and prices are very weak. Cookson's is offered at 8.15c. and 7.87½c. is asked for Hallett's. Hunagrian grades are offered at 7.25c. and some Chinese grades are selling as low as 7.40c.

Old Metals.—The market is dull, and dealers' selling prices have been lowered in some instances. We quote to-day's market as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	11.25 to 11.50
Clean brass turnings	7.75 to 8.00
Composition turnings	9.00 to 9.50
Lead, heavy	4.05 to 4.20
Lead, tea	3.80 to 3.95
Zinc scrap	4.15 to 4.25

THE IRON AND METAL MARKETS

Metals, **Chicago,** September 6.—Local interests have been selling copper the past week for November delivery, and a fair amount of business has been closed without any change in current prices. Tin has recovered from the decline last week and the local market is unchanged. Spelter is a shade higher. We quote Chicago prices as follows: Casting copper, 12¾c.; lake, 13⅛c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, car lots, 36½c.; small lots, 37½c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.30c. to 5.35c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10¾c.; copper clips, 12c.; red brass, 11½c.; yellow brass, 9c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4⅛c.; pewter, No. 1, 25½c.; tin foil, 29c.; block tin pipe, 31c.

Metals, **St. Louis,** September 5.—Lead is quiet at 4.30c.; spelter is active and strong at 5.25c., East St. Louis. Zinc ore is strong under good buying at $42 to $43 per ton, Joplin base. Tin is quoted at 35.75c. per pound; antimony (Cookson's), 8.60c.; lake copper, 13.22½c.; electrolytic, 12.95c., all at St. Louis. The demand for finished metals was moderate, as is usual at the end of the month. The demand from railroads is smaller.

Iron and Industrial Stocks

NEW YORK, September 7, 1910.

Little interest has been taken in the stock market the past week, the volume of transactions having been unusually small. The trend was downward, but there was no special development in the business world to cause a movement in that direction. In the absence of anything more important, the decline was attributed to the utterances of our ex-President on his Western tour. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., pref.	31		Pressed St., pref.	93	93½
Beth. Steel, pref.	57¼ - 58		Railway Spr., com.	31½ - 32	
Can, com.	8½ - 8½		Railway Spr., pref.	91 - 91½	
Can, pref.	68½ - 68½		Republic, com.	29½ - 30	
Car & Fdry, com.	46½ - 47¾		Republic, pref.	94	
Car & Fdry, pref.	110½		Sloss, com.	55 - 56	
Steel Foundries	43		Pipe, com.	16 - 16½	
Colorado Fuel	29¼ - 30		U. S. Steel, com.	68⅞ - *69½	
General Electric	*141¾		U. S. Steel, pref.	115½ - 116¾	
Gr. N. ore cert.	53⅜ - 54½		Westinghouse Elec.	59	
Int. Harv., com.	94½ - 97½		Am. Ship, com.	77	
Int. Pump, com.	38⅝ - 39		Cambria Steel	41½ - 42⅛	
Locomotive, com.	34½ - 35⅝		Lake Sup. Corp.	21 - 22	
Locomotive, pref.	103½		Pa. Steel, pref.	108	
Nat. En. & St., com.	15½ - 16		Crucible Steel, com.	12 - 12¼	
Pressed St., com.	34 - 35		Crucible Steel, pref.	76½ - 76¾	

* Ex dividend.

New Tools and Appliances

Combined Cam and Valve Grinder.—The Bay State Grinder Company, Worcester, Mass., has built a machine carrying two 1 x 12 in. wheels mounted in interchangeable collets, which is provided with attachments for grinding gas engine cams and valve faces. The cams are ordinarily ground one at a time, but two can be ground simultaneously if the combined length of the hubs does not exceed 3½ in. Two arbors with No. 4 Morse taper shanks and ground to correspond to any size of cam shaft are furnished with each attachment. The master cams are generated by grinding from models furnished by the customer, and the rough cams are ground from the model. The master pattern rotates against a hardened steel plate turned to the same size as the grinding wheel, and as the latter wears down another guide plate of the reduced size of the wheel is turned into position for the master cam to rotate against and so on until the grinding wheel is worn out. The valve face grinding attachment has a hardened and ground spindle fitted with a draw-in chuck, which will grind valves without using center holes. This attachment is regularly furnished for a face angle of 45 degrees, but can be furnished for any angle desired, and a special attachment for grinding valves on centers is also made. Both these attachments can be detached from the table, so that the machine can be fitted with one of each or two of either kind, or with an internal grinding attachment, so that the complete outfit can be used if desired.

New Line of Unions.—The E. M. Dart Mfg. Company, Providence, R. I., is making a new line of unions which are an adaptation of the company's regular union, having two bronze seats and used in connection with the regular forms of pipe fittings. These new unions can be made in any desired combination. These fittings are said to possess the strength of iron pipe fittings in the pipe end, and are made with strong nuts, substantial shoulders and in heavy patterns.

New Electric Tools.—The New York Electric Tool Company, 136 Liberty street, New York, is bringing out a new line of electric tools, including drills, tool post grinders and portable buffers having many novel features. At present the drills are made in three sizes. The smallest has a capacity for drilling ¼-in. holes in steel and ½-in. in wood, is 10½ in. high and 4 in. in diameter and weighs 6½ lb., while the largest will drill ¾-in. holes in steel and 3-in. holes in wood, weighs complete 22 lb. and is 14½ in. high by 5 in. in diameter. Each drill has a four-hole, form-wound series motor, with a cylindrical frame of crucible steel annealed to give the maximum permeability. The armature is built up of soft steel laminations, insulated with a coating of special japan and mounted on a hollow steel shaft, which drives the chuck spindle by hardened steel and phosphor bronze gears. A thrust bearing with steel balls is provided for taking up the thrust. The tool post grinder, running on direct current, is fitted with a ¼ x 3 in. wheel, which runs at 6000 rev. per min., and is especially adapted for grinding lathe centers, although it can be used equally well on a shaper or planer for surface grinding. Means are provided for excluding dust from the bearings, and the positions of the oil cups are such that the bearings are lubricated in any position the grinder may be placed. A novel feature is the offsetting from the center of the wheel shaft, thus permitting the use of grinding wheels of very small diameters. The portable buffer, which can be run on either alternating or direct current, weighs 6½ lb., and drives a 3-in. rag wheel at a speed of 5000 rev. per min. It does very effective work on metals (particularly those used on automobiles) that need a burnish instead of a polish to protect them from the weather. The buffer has ball bearings for the shaft, and an extension front head of small diameter, so it can be used in getting at difficult corners and inaccessible places.

A New Type of Friction Clutch.—The Hill Clutch Company, Cleveland, Ohio, has brought out a new Smith friction clutch. The same principle of action that has been embodied in the standard clutch of this company has been retained, but a number of changes have been made in its design and construction which adapt it for heavier and more continuous service. These clutches are built in three sizes, having three, four and six arms, according to their capacity, and the frictional resistance is produced by wood rubbing against iron. The shoe area is very large, and the coefficient of friction is claimed to be the same at all points, due to the improvements which have been made in the clutch. The engagement of the clutch is positive, a toggle action being employed to apply the pressure instead of springs. Two special features of this clutch are the ability to remove any working part for repairs without disturbing the main spider casting or pulley, and the self-centering feature by which the jaws form a shaft-aligning device without the use of shaft bushings.

Cast Iron Soil Pipe Prices.—Corrected soil pipe prices, received too late to appear in "Mill and Machinists' Supplies" in another part of this issue, are as follows: Standard, 2 to 6 in., 68&10&10&5% discount; extra heavy, 2 to 6 in., 73&10&10&5; fittings, standard and heavy, 80&10&10&5, all delivered at Eastern points.

Both the Alleghany and Buena Vista furnaces of the Oriskany Ore & Iron Corporation, Iron Gate, Va., are now in blast, the former having been blown in September 2 after repairs.

The American Locomotive Company

Report for the Fiscal Year Ending June 30, 1910

The ninth annual report of the American Locomotive Company, including the Montreal Locomotive Works, Ltd., covering the operations of the fiscal year ending June 30, 1909, presents the following statement of earnings, as compared with the previous year:

	1909-10.	1908-09.
Gross earnings	$32,203,392.10	$19,008,633.97
Manufacturing, maintenance and administrative expenses and depreciation	29,605,443.09	17,665,962.38
Net earnings	$2,597,949.01	$1,342,671.59
Interest, &c., on bonds of constituent companies, coupon notes, &c.	513,190.69	355,532.36
Profit	$2,084,758.32	$987,139.23
Dividends on preferred stock at 7 per cent.	1,750,000.00	1,750,000.00
Surplus	$334,758.32	*$762,860.77
Net credit to profit and loss	$334,758.32	*$762,860.77

* Deficit.

The condensed general balance sheet, as of June 30, 1910, is as follows:

Assets.		
Cost of property		$51,741,791.57
Securities owned:		
Richmond Locomotive & Machine Works bonds.		118,000.00
Sundry securities		495,800.00
		$613,800.00
Convertible assets:		
Cash		$1,702,268.77
Accounts collectible		9,698,072.97
Bills receivable		817,508.04
Accrued interest		3,514.98
Material and supplies		5,375,900.89
Contract work in course of construction		2,218,812.43
Steam shovels, contractors' locomotives and automobiles manufactured for stock		286,389.99
		$20,102,468.07
Notes discounted (per contra)		$2,433,584.25
Total		$74,891,643.89
Liabilities.		
Preferred stock		$25,000,000.00
Common stock		25,000,000.00
		$50,000,000.00
Bonded debt of constituent companies:		
Richmond Locomotive Works		$550,000.00
Dickson Mfg. Company		562,500.00
Rogers Locomotive Works		305,000.00
Montreal Locomotive Works		1,500,000.00
		$2,917,500.00
Current liabilities:		
Gold coupon notes		$6,911,000.00
Accounts payable		3,337,707.58
Accrued interest		121,866.68
Unclaimed interest		1,587.50
Dividends on preferred stock, payable July 21, 1910		437,500.00
		$10,809,661.76
Endorsements (per contra)		$2,433,584.25
Extraordinary additions and betterment fund		689,788.47
Profit and loss:		
Balance June 30, 1909	$7,706,351.09	
Add profit as shown in summary of operations above	334,758.32	8,041,109.41
Total		$74,891,643.89

From the accompanying statement to the stockholders by President W. H. Marshall, the following extracts are taken:

"The surplus, after a charge for depreciation of $803,484.35 and the payment of the preferred dividend, was $334,758.32, as compared with a loss of $762,860.77 last year, showing an improvement in the net results of $1,097,619.09. During the first half of the fiscal year there was but slight increase in the monthly output, as compared with that of the preceding year of depression, the revival in plant activities being confined to the six months ended June 30, 1910. About the time of this resumption in activity the agitation throughout the country for increased wages spread to our plants, and this company, in common with other industrial and railroad companies, made substantial increases in wages of shop employees. As a large part of the output for the year had been sold at prices which did not anticipate the extent of such labor increases, there was a resultant decrease in the margin of profit.

"To meet the constantly increasing demand for an economical commercial vehicle, and in view of the possibilities of this line of industry, the automobile department has devoted considerable study to perfect the design of commercial trucks. We now have on the market a most successful 3-ton truck. A 5-ton truck has been developed and will be put on the market during the present year.

"The Board of Directors on August 25, 1909, authorized the issue of $5,000,000 par value 5 per cent. gold coupon notes, dated October 1, 1909, in three series, as follows: F, $1,000,000, maturing October 1, 1912; G, $2,000,000, October 1, 1913; H, $2,000,000, October 1, 1914. These notes were issued for the purpose of providing funds for increasing the capacity of the company's plants, principally at Dunkirk, Richmond and Schenectady, the expenditures aggregating between $3,500,000 and $4,000,000. A large part of these expenditures have already been made, and it is expected the work will be completed by January 1, 1911. The company has also spent on its plants during the year $482,708.58 of the extraordinary additions and betterment fund, leaving a balance in that fund of $689,788.47.

"In the forepart of the year, a surplus of cash having accumulated in excess of immediate needs, the company purchased such of the notes maturing in 1910 as were offered at favorable terms. On October 1, 1910, there will be paid the balance of the fourth installment of short term gold notes, amounting to $911,000, which were issued October 1, 1906, leaving a balance outstanding of this issue of $1,000,000, and total outstanding notes of $6,000,000.

"At the beginning of the fiscal year the company had unfilled orders on its books amounting to $6,150,000, and on July 1, 1910, the amount was $17,550,000.

"The balance sheet includes a charge of $2,433,584.25, representing equipment trust notes discounted by this company in advance of maturity, and as there is a possible obligation in the event of any default in payment, a like amount is also shown as a contingent liability. The notes are secured by a lien upon the locomotives and the security is ample."

The Carnegie Dock & Fuel Company has purchased 80 acres of land adjoining the property of the Zenith Furnace Company, Duluth, Minn., and will spend about $1,500,000 in the erection of a coal handling plant on the property. According to reports from Duluth the dock will be 2700 ft. long, 350 ft. wide and will be equipped with the most approved coal handling machinery. It is expected that the work will be pushed early next spring, although a start may be made this fall.

The Jones & Laughlin Steel Company is rapidly finishing up its new construction work at Aliquippa, Pa., and its No. 4 blast furnace may be started this month. One or two of the four Talbot open hearth furnaces are also scheduled to start early in October.

The National Tube Company had one furnace in blast September 1 out of the five at its Lorain, Ohio, group. Two of these furnaces went out in August, one on August 14 and the other on August 31.

The Machinery Markets

The machinery trade is improving in a number of commercial centers from which reports of dull business have been coming for the last three weeks. The expansion of the Labor Day holiday to several days, now so general in the East, has affected business slightly in and around New York, but trade shows more life in Chicago, Cleveland and Detroit, for instance, where it has been rather dull of late. In all those localities a good fall business promises to materialize. In the Northwest a heavier volume of business is noted, and inquiries from jobbers and dealers in Minnesota and the Dakotas are coming in stronger. There is a good call for equipment from the mining districts. Trade has begun to pick up in the South, and inquiries are more numerous. The indications in that territory are that requirements for new equipment will be very large during the coming fall. In the Southwest funds coming from the sale of crops are being invested in the machinery trade to such an extent that the market there has been put on a good basis. An increase in buying is noted in the Central West, and the tone of the market both there and on the north Pacific Coast shows a decided improvement.

New York

NEW YORK, September 7, 1910.

With the exception of orders that have come in from the New York Central Lines and the Delaware, Lackawanna & Western Railroad, the machinery trade in New York the past week has been rather dull. This is to be partly accounted for by the Labor Day holidays. Inquiries have fallen off and there are no new developments in the forthcoming projects which have been mentioned in these columns in the last three weeks. There is an undercurrent of optimism among dealers and manufacturers' representatives in New York and vicinity and if only half of the business in sight materializes trade in the fall should be very good.

Manufacturers of leather belting have been very busy of late and orders have been coming in so well that advanced prices which were made about nine months ago are being maintained. Prices in leather belting fluctuate more than machinery prices and this should be taken as an indication that business is excellent in that line. Most of the orders booked lately among leather belting houses have been for replacements rather than for new projects, but it is reported that there are some large inquiries in that trade calling for belting for new enterprises and if they result in business manufacturers of power equipment will probably share in the projects.

It is understood that the United States Lighting & Heating Company, 30 Church street, New York, which is preparing to buy for a large plant at Niagara Falls, expects to move considerable of its machinery to Niagara Falls from other plants. Nevertheless, this equipment will be supplemented by additional new machinery which will call for expenditures amounting to a good round sum.

The machinery trade in general has been experiencing a good call for equipment from manufacturers of agricultural implements. The International Harvester Company is a good customer just now and there are inquiries out from large plow making concerns. American agricultural manufacturers are extending their export business much faster than manufacturers in other lines of mechanical equipment and their purchases are going far toward supporting the market at this time.

The Henry & Wright Mfg. Company, Hartford, Conn., has been highly gratified to find that its business in the month of August proved to be the largest for any month in its history. The company manufactures ball bearing drilling machines.

The Bridgeport Chain Company, Bridgeport, Conn., manufacturer of welded steel wire chains, has made a large increase in its capital stock. Plans and specifications have been made for extensive additions to the plant, but the increase will not be made this year, but next, should business conditions require the greater capacity at that time. The company builds its own automatic machinery, and at present a large number of these machines are in process of construction, the ultimate aim being that facilities shall be so great that it will not be necessary to operate the factory overtime. The company has been obliged to run 24 hours a day during a portion of the last and present year in order to meet the demands of customers.

The Seymour Iron Foundry, Seymour, Conn., will erect a new foundry on a site just purchased on North Main street. The main building will be of reinforced concrete and brick, 50 x 200 ft., one story, and fireproof throughout. The cupolas and coreroom will be in an ell, 15 x 50 ft. Ample light will be provided, the north end being composed practically entirely of windows, while overhead will be large steel frame skylights. The foundry will have two cupolas, one for the regular line of machine castings, the other for special work. Three cranes will provide for the handling of heavy work and an industrial railway will assist in the economical operation of the plant. An office building, 30 x 40 ft., will contain room for pattern storage. The business was established in 1899. E. A. Klatte is the sole owner.

The American Valve Company, Coxsackie, N. Y., is erecting a power station, 60 x 66 ft., in which will be installed two 100-kw. generators, to be direct connected to a 125-hp. Ideal engine. The company's new equipment will include a lighting plant and a vacuum steam heating system, all of which will be in operation about October 1. The company is also breaking ground for a two-story fireproof pattern storage building, 20 x 40 ft.

The McKim Foundry & Machine Company, Lockport, N. Y., has been incorporated with $25,000 capital stock, to take over the business and continue the operation of the McKim plant on Green street, the capacity of which will be tripled by the erection and equipment of an extensive brick addition. The officers of the new company are: President, Daniel G. McKim; vice-president, Lawrence J. Hooker; secretary and treasurer, Harry Wood, formerly of the Lockport Rubber Company.

L. P. Rays, Carthage, N. Y., is erecting a factory for the manufacture of automobile lamp shades. Considerable machinery and equipment will be required.

The Wiard Plow Company, Batavia, N. Y., has completed plans for a foundry addition of brick and steel, 60 x 70 ft., to its plant on Swan street and the New York Central Railroad.

The Norton Carborundum Company is arranging to enlarge the capacity of its plant, at Chippewa, Ont., by the addition of six electric furnaces.

The Reddin Iron Works, Syracuse, N. Y., has completed plans for the erection of a new foundry building, 77 x 148 ft., adjoining its present plant.

The Reading Iron Works, Reading, Pa., has let contract for a 34 x 50 ft. addition to the boiler house at its plant on Cedar street.

The Reading Saddle Mfg. Company, Reading, Pa., will erect and equip an addition to its factory on Maple street.

The Canadian General Electric Company is receiving bids for an extension of the machine shop at its plant in Petersboro, Ont. Frederick Nichols, second vice-president, 212 King street, West Toronto.

The Pennsylvania General Electric Company has had plans completed and is receiving bids for a gray iron foundry building, 450 x 800 ft.; also for two other foundry buildings, each 200 x 400 ft., two stories, and for a machine shop, 161 x 400 ft., two stories, to be built at its plant in Erie, Pa. Brick, steel and concrete construction.

The Erie City Iron Works, Erie, Pa., is having plans prepared for an office building addition to its plant, 65 x 88 ft., two stories and basement, of brick and structural iron.

Crandall, Stone & Co., Binghamton, N. Y., manufacturers of carriage hardware, have let contract for a machine shop addition, 50 x 100 ft., two stories.

The Washburne Mfg. Company, Syracuse, N. Y., has been incorporated with $125,000 capital stock, to manufacture radiators, pipes and pipe fittings. The incorporators are J. L. Washburne, J. A. [illegible] and M. West of Syracuse.

DESCRIPTIONS, Mechanical and Civil Engineers,

THE MACHINERY MARKETS

Philadelphia

PHILADELPHIA, PA., September 6, 1910.

As was pretty generally expected, the volume of business transacted by the trade during August was usually below the average for that month, customarily a dull one under ordinary circumstances. The vacation season has had considerable effect on negotiations under way, and in many cases interfered with the closing of propositions which the trade had hoped to clean up early in the summer. The past week showed no betterment in the demand; the final holiday of the summer season, Labor Day, was pretty generally observed, and the transaction of business, unless particularly urgent, deferred. During the current month, however, the trade feels that the market will show some betterment; scattered railroad inquiries, which have heretofore been awaiting final action, are expected to close up, and if the expected improvement in the iron and steel trade develops the demand for machinery should show more activity.

What little business has been done has been confined to small equipment of a miscellaneous character, usually single tools. The diminished buying by the automobile trade is felt sharply, but there is some further business of this character in sight. Railroad buying in this district has also been very meager, but the outlook is somewhat better, although no very large individual lists are anticipated. Machine tool builders are for the most part still busy on orders previously on their books. There have been few cancellations here, and few have been the builders who have had to run in stock orders to any extent to keep fully occupied. There is no doubt, however, that the majority of manufacturers would be glad to be able to get some little stock ahead, so that they may be prepared to make good deliveries when the demand begins, as, no doubt, at that time, purchasers who have been deferring orders will want the earliest possible shipments.

Quiet conditions are reported in the demand for second-hand machinery, which branch of the trade is governed largely by the same conditions that influence the demand for new tools. Less active inquiry is noted for power equipment: there is a very fair volume ahead and some little business in the smaller classes of boilers, engines and electrical equipment is constantly being transacted. The foundry trade shows no increased demand and very few foundries are working up to full capacity.

The Philadelphia & Reading Railroad Company is about ready to ask for bids for the construction of an elevated railroad to replace the present grade tracks of its Port Richmond branch in this city. The work will cost about $3,000,000. Contracts have recently been placed by the Reading Company, it is stated, for considerable preliminary work in connection with a proposed creosoting plant, to be erected at Port Reading, N. J.

It is said that a large manufacturing plant is to be erected at Seventh and Filbert streets. No definite information is available, but a number of properties in that vicinity have been recently acquired with the purpose stated in view.

The Barrett McKee Company, Baltimore, Md., has commissioned Owens & Siscoe, architects, in that city, to prepare plans for a large factory building to be erected at German and Greene streets. The structure is to be three stories and will be used as a shirt factory.

The city of Hancock, Md., which recently received bids for the construction of a water works plant, has, it is reported, decided to reject all bids and readvertise for new prosopals. Penniman & Fairley, Marine Bank Building, Baltimore, are the engineers.

The City Service Company of New York was incorporated last week under the Delaware laws with a capital stock of $50,000,000, and is empowered to engage in the manufacture and distribution of light, gas, heat and power. A. P. Anderson of New York, and James M. Satterfield and A. B. Magee of Dover, Del., are the incorporators named, who refuse any details of the company's plans at this time.

The Wilkinson Foundry & Mfg. Company has been incorporated with a capital of $200,000, and will manufacture and deal in automatic stokers and machinery. The incorporators named are Joseph C. Laird, John J. McGuirk and Charles S. Wilfong. Particulars are not available.

The Hutchinson Baking Company will erect a new building for baking purposes in Walnut street, below Thirty-third street, where property, 98 x 256 ft., has recently been acquired. The contract for the building has, it is stated, been awarded to Joseph Bird.

The Crook-Horner Supply Company, Baltimore, Md., has been incorporated with a capital stock of $100,000 for the purpose of manufacturing, purchasing and dealing in plumbers', machinists' and mill supplies. Its headquarters will be in Baltimore. The following are the directors of the new concern: William H. Pitcher, Harry A. Booth, K. Kunnecke, J. S. Schuseler, Emil Boucher and Charles E. Schaur.

The John T. Jones Holding Company, Camden, N. J., has been incorporated under the New Jersey laws, with a capital stock of $1,000,000, for the purpose of manufacturing steel and metal bands. The incorporators are John T. Jones, Albert Jones and Elmer Jones.

The Packard Motor Car Company, in this city, is preparing to erect a four-story building at Broad and Wood streets, which will be used by it as a garage. The property acquired for the purpose measures 70 x 300 ft. Plans for the erection of several other large garages by automobile interests are understood to have been completed, one of which is to be located at Broad and Wallace streets, but those interested state that they are not yet prepared to make their plans public.

Chicago

CHICAGO, ILL., September 6, 1910.

Conditions are improving in the Chicago machinery trade. Dealers have received more inquiries the past week, and the outlook for fall trade is generally brighter. There has been a fair volume of trade all summer, making due allowance for the usual dullness of the midsummer season, but the very large sales of tools to automobile manufacturers a year ago have been missed this summer. It has taken a considerable increase in orders from other fields of the machine tool trade to make up for the absence of automobile and railroad purchases. There is no new light in the machinery market on the policy of the railroads. The witnesses who have appeared thus far before the Interstate Commerce Commission have made a poor showing to justify a general advance in rates, and there is a feeling that recent scandals in the management of a leading Western road will have the effect of defeating or postponing the general advance which the railroads have sought. The purchase of new tools, like the purchase of cars and locomotives, has been held in suspense by the railroads, awaiting fulfillment of their hopes of larger revenues. Something will have to be done soon, however, as a severe car shortage is expected this winter, on account of the run-down conditions of locomotives and cars. Shop facilities have not been kept up for repair work, so that cars and engines are in no condition to go into the strain of winter traffic.

The Chicago, Burlington & Quincy is taking a long time to close on purchases for the new shops at Havelock, Neb., which were completed early in the summer. A committee of the company's mechanical experts has spent two months visiting factories on whose tools bids have been submitted. Machine tool men like the idea, as it enables them to give practical demontsrations and tests of their tools, and the members of the committee will gather technical ideas which will make their tour a good investment of their time. The committee, wherever possible, recommends three competing tools, leaving the choice of the three to the purchasing department. The only disadvantage of this plan for selecting tools is that a committee cannot visit all the manufacturers who bid on a large list, and those who do not have the opportunity for a demonstration in their shops are placed in an unsatisfactory position.

Old settlers on Canal street, in Chicago, do not like the publication of reports that the machinery district is being removed to Jefferson street. A large and important section of machinery row remains undisturbed on Canal street, on the east side, north of Washington street. The large Chicago stocks of Manning, Maxwell & Moore and Hill, Clarke & Co. remain in the block north of Washington street. The O. L. Packard Machinery Company and many other houses remain at their former locations. It is understood that most of these houses have long leases, with option for renewal, and they are not likely to be disturbed by any upheaval in connection with plans for a new Union Depot.

It has been understood that the largest stock of machinery in the world was carried on Canal street. Several years ago the business overflowed to Clinton and Jefferson streets, so that the district now covers three streets instead of one. This section of Chicago is becoming more important every year in commercial activity. A new Federal building for the postal service will be located in the near future in or near the machinery district. The Government now has a $9,000,000 investment in a post office building in the heart of the loop, but other Federal business is crowding the postal service, and plans are under way for a new business west of the river to be used exclusively for postal business.

The Emerson-Brantingham Company, Rockford, Ill., has completed a new concrete factory building, 742 ft. long, three stories. The new building will be occupied by the company's wood shop, experimental department, pattern shop and har-

THE MACHINERY MARKETS

row department. An addition has also been made to the plow shop.

The Standard Construction Company, South Bend, Ind., general contractors, has been incorporated with $30,000 capital stock by Andrew Dushane, George Allen and Rex T. Miller.

The Universal Lifter Company, Worthington, Ind., has been incorporated with $10,000 capital stock to manufacture hoisting machinery. The directors are A. F. Wilson, G. L. Wilson and Guy Wilson.

Cincinnati

CINCINNATI, OHIO, September 6, 1910.

There has been a slight change in the business from the automobile industry, and some machine tool builders have lately received a few orders from this source. There is also an easier feeling over the expected further cancellation of orders booked some time ago. In spite of this a few shops have temporarily laid off some of their men, but as business from the general trade is holding up fairly well, and with many inquiries in hand, it is not expected that this condition will last long.

The railroads continue indifferent buyers. Several large lists have been figured on and others are known to be pending, but late purchases have been very light. As an instance of how badly some roads need equipment, one large system entering Cincinnati has been held up in switching cars promptly because the yard locomotives were in no condition to handle the traffic. This would probably be denied by the higher officials; nevertheless, it is true. The inference is that if the switching equipment is in such a condition that on the road must be equally as bad and probably worse. If so, the movement of the crops will develop a serious problem and may call for some large and quick expenditures this fall for rolling stock and repair shop tools.

Some of the foundries are busy on day to day work, while others are operating on light time. The business is sporadic and frequently a foundryman will close down Saturday with just a day's run ahead, and on Monday morning receives enough orders to keep him pouring the entire week.

The demand for the larger sizes of steam units, together with the satisfactory amount of repair work coming in, has enabled the Tudor Boiler Works Company to keep its plant on Third street, Cincinnati, running on full time. This same condition probably exists with all boiler factories that take in repair work, the volume of which generally counterbalances the scarcity of new orders.

The Theo. Hirschfeldt Sons Company has begun work on the erection of a one-story brick cooper shop, 60 x 90 ft., in the Camp Washington district, Cincinnati.

Among recent contracts taken by the Roche-Bruner Building Company, Cincinnati, is one for a 11-story steel and concrete office building to be constructed at Huntington, W. Va., for Robson & Pritchard of that city.

Work is progressing rapidly on the new horse collar factory of the Couch Brothers Mfg. Company, North Fairmount, Cincinnati. The building will be three stories, 50 x 125 ft., and of brick and steel construction.

The E. H. Bardes Range & Foundry Company, Cincinnati, has commenced work on a one-story brick addition to its plant, 35 x 55 ft., which will be used as a pattern storage room.

A three-story addition, 60 x 90 ft., of brick and concrete construction, is planned for the factory of the Corcoran Lamp Company, 1710 Reading road, Cincinnati.

The Dayton Auto Truck Company is a new incorporation at Dayton, Ohio, with $50,000 capital stock. The incorporators are Louis L. Wehner, Geo. W. Ozias, Chas. A. White and Henry A. Lewis. It is stated that a factory will be erected for the construction of brewery trucks, but no building details are yet available.

Carl A. Albrecht, Second National Bank Building, Cincinnati, is the principal organizer of the Carla Land & Irrigation Company that contemplates developing some coal lands in Dimmit County, Texas. A short railroad and an electric power plant will be constructed as soon as the company completes its incorporation.

The foundations for the new machine shops of the Chesapeake & Ohio Railroad near Melbourne, Ky., are about completed, and work on the buildings will be pushed. The railroad company denies that it will move its Covington, Ky., shops to the new location, as has been currently reported, but states the Melbourne shops are intended to relieve the congestion at some of its other points where repair work is done.

The Dean Mfg. Company, Newport, Ky., has just received an order from Australia for 15 of its Fox two-cycle marine motors.

The Toledo Computing Scale Company, Toledo, Ohio, has increased its capital stock to $900,000. L. S. Rose is president of the company.

The International Steel & Iron Construction Company, Evansville, Ind., has been incorporated with $100,000 capital stock, as manufacturers and contractors. The directors are H. F. Decker, F. G. Weber, O. J. Oehlkuch and Henry Bohnsack.

The Louisville Cement Company is experimenting with a new cement manufactured at its plant at Speeds, Ind., which it is believed will be superior to Portland cement and, if successful, will revive the cement industry in southern Indiana. The various plants in which at one time a large part of the cement of the country. The new product is made of hydraulic cement, plaster of Paris and steel slag. With the exception of one ingredient, the raw material for the new cement is all found in Clark County, where the plant is situated.

The Sheet Metal Specialty Company, Evansville, Ind., has been incorporated with $10,000 capital stock, to manufacture car fenders. The incorporators are Jesse, Frederick and Edna Helser.

The Lexington Motor Car Company, Connersville, Ind., has increased its capital stock from $50,000 to $100,000. T. M. Coats is president of the company.

The Merchants' Heat & Light Company, Indianapolis, Ind., will add to its new plant a 10,000-hp. engine, in preparation to bid on the city electric street lighting. The order has been given to the Allis-Chalmers Company of Milwaukee.

Cleveland

CLEVELAND, OHIO, September 6, 1910.

With the beginning of September a little more life has appeared in the local machinery market and the general feeling seems to be improving. Now that the vacation season is practically over dealers are looking for an improvement in orders. Sales during the week were light and no large inquiries came out, but business suffered the usual interruption from the holidays. Some of the dealers see a good indication in the fact that their August sales showed a slight improvement over July. Builders of some lines of machine tools report conditions better than are found by the dealers. For example, a leading maker of turret lathes states that with the exception of the automobile trade, which is buying very little at present, the sales of their company are practically normal, the demand being well scattered among various users. Having confidence that general conditions will be good some of the local manufacturers in metal working lines are planning plant extensions and others that previously arranged for additions are going ahead with their improvements. In most cases the purchase of the additional equipment needed is being delayed until the extensions are well under way.

The demand for electrical equipment is quite satisfactory. While no inquiries for large installations are coming out a good volume of business in small orders is being booked. Considerable of this business is coming from northern Ohio lighting plants, that are buying more new equipment to replace old or for extensions than they have at any previous time during the past two years.

Obstacles in the shape of negotiations with the city over the possession of lake front land, which for a time held back the extensive dock improvements planned by the Pennsylvania Railroad along the west breakwater in Cleveland, have been finally removed and the work of filling in is now going ahead at the rate of about 100 carloads per day. Plans for the docks are now being prepared at the office of the chief engineer in Pittsburgh. The docks will probably be of concrete. It is not expected that the dock work can be started before next summer, and it will be some time later before the machinery can be installed. It will take about two years to complete the improvements. The equipment will include large coal and ore handling plants. The handling plants will be installed close together, so that when a car of coal is unloaded the car can be moved quickly on a gravity track to take on a load of ore. In connection with the general improvement the Pennsylvania Railroad will in the next few months erect a McMyler car dumper on the coal docks on the east side of the Cuyahoga River to replace the present coal handling machinery at that point, the capacity of which is too small for present needs.

The Cleveland Foundry Company is planning the erection of a large new plant, which will eventually be as large as its present plant. A 12-acre site has been purchased on Ivanhoe road in the new manufacturing district in the eastern part of the city, along the Nickel Plate Railroad, on which construction work is expected to be started this fall. The preparation of plans is now in the hands of engineers. The company has grown very rapidly during the past few years,

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and it has no room for further extensions at its present large plant on Platt street. With the erection of the new plant the company will have two plants in operation in different sections of the city.

The W. S. Tyler Company, Cleveland, maker of ornamental metal work, will enlarge its plant by the addition of three stories to its main building, 64 x 264 ft. Plans are being prepared by George S. Rider & Co., engineers. The addition will be of steel and mill construction. For the present the additional room will be used largely for warehouse purposes.

The plant of the Van Dorn Electric Mfg. Company, Cleveland, was recently taken over by the Van Dorn & Dutton Company, which occupies an adjoining plant and was owned by practically the same interests. The business of the former company is now being conducted as the electrical department of the Van Dorn & Dutton Company, the products of the department being electric drills and reamers. The company reports that it is well filled with orders. Some of its gear products are sold up for about 10 months ahead.

At the recent annual meeting of the Ohio State Boiler Company, Lorain, Ohio, H. O. Wormser retired from the general managership. Officers were elected as follows: H. O. Wormser, president; H. Y. Baxter, vice-president and general manager; H. L. Worden, secretary and treasurer. The officers and John Schoenberger, Frederick Burgett and Dr. E. V. Hugg comprise the Board of Directors. This company was organized some months ago to manufacture a new type of boiler. Two boilers are being constructed at the plant of the Brunk Machine & Forge Company, and it is announced that as soon as their efficiency can be demonstrated steps will be taken to establish a plant for their manufacture.

The Sabin Machine Company, Cleveland, has changed its name to the Sabin-Curtis Machine Company, being recently incorporated under that name. The company has outgrown its present quarters and will soon begin the erection of a new plant, a site for which is now under consideration. Some new equipment will be needed. The company makes special machinery and will make some additions to its present products.

Through the efforts of the Board of Trade at Warren, Ohio, it is announced that the Vulcan Furnace Company will remove from Buffalo, N. Y., to that city and establish a plant for the manufacture of mechanical fuel feeders. The Board of Trade is to erect a plant, 40 x 120 ft., which the company is to lease. It is expected that it will be ready for operation by November 1.

The new foundry of the Orville Pump & Furnace Company, Orrville, Ohio, was placed in operation a few days ago. The main building is of steel, brick and concrete, 63 x 152 ft. The front, 30 x 63 ft., two stories, contains the pattern shop and offices. The cupola has a capacity of seven tons per hour. The plant is equipped with a 60-ft. electric traveling crane. The power equipment, in an adjoining building, consists of a 120-hp. Corliss engine, two 100-hp. boilers and two 50-hp. generators. The company will shortly begin the manufacture of pumps in addition to its other products.

The contract for the new plant to be erected in Cleveland by the Reliance Electric & Engineering Company has been let to the Carey Construction Company of Cleveland. The work is now under way.

The Cleveland Castings Pattern Company reports a good demand for patterns of various kinds. Among other orders this company has just received one from the Erie Railroad for about $5000 worth of patterns for locomotive cylinders, wheels, frames, &c.

The plant of the Vanrot Metal Company, Lorain, Ohio, was practically destroyed by fire a few days ago, the loss being about $8000. The buildings were a complete loss and the furnaces and machinery either totally destroyed or badly damaged. It is announced that the plant will be rebuilt at once.

Pittsburgh

PITTSBURGH, September 6, 1910.

There has not been much improvement in actual market conditions since last reported, so far as the sale of machinery is directly concerned, but the outlook for future business is more encouraging, partly as a result of the betterment in the situation affecting the products of the furnaces and mills, of which the settlement of the tin plate strike and kindred difficulties is an example. Moreover, the slate has been wiped pretty clean, and for the coming productive season the manufacturers and dealers of the Pittsburgh district are getting what practically amounts to a fresh start, without any, or at least with a veritable minimum, of the encumbrances that ordinarily accumulate between spring and autumn. Stocks of machinery in the hands of dealers, both new and second-hand, are generally free from material which is difficult of sale; most manufacturers have put themselves in a position to provide for an enlarged output with prompt deliveries; labor conditions are favorable; prices have been holding firm, and there is less cutthroat competition than the trade has known for years past. Altogether, therefore, the situation would be exceptionally promising were it not for the turmoil throughout the country caused by the approaching elections. To what extent this condition will hinder the normal development here of fall trade it is as yet too early to determine.

It is announced that the two-story brick manufacturing plant formerly occupied by Jas. Bonair & Co., containing a brass foundry, tin shop and power plant, with boiler, engine, &c., together with operating machinery and other equipment, will be sold at public auction on the premises, Fortieth street and the Allegheny Valley Railroad, Pittsburgh, on September 15. The book accounts, rights, privileges and franchises of the company, which is a Pennsylvania corporation, will be included in the terms of sale.

The Riter-Conley Mfg. Company, Pittsburgh, has been awarded a large contract for piping, which will be put to an unusual use. It includes 5224 ft. of 26-in. and 36-in. mains to be used as siphons in diverting the flow of a river from one side of the mountains to the other in connection with the Uncompahgre Valley irrigation project in Colorado. This is being carried out by the United States Reclamation Service.

Manufacturers here will figure on the equipment of a new electric generating station to be built by the Frederick Railroad Company, Frederick, Md., which is expected to be of large capacity. Steam turbines and alternating current generators will probably be selected for the main units, with auxiliary apparatus to correspond.

The Massillon Bridge Company, Massillon, Ohio, has been awarded the contract to build a large steel bridge over the Cimarron River not far from Sapulpa, Okla.

Improvements which will involve the purchase of some new equipment, including electrical apparatus and probably air compressors, pneumatic appliances, &c., are to be made in the yards of the Erie Railroad at Meadville, Pa.; Kent, Ohio, and Jamestown, N. Y.

It is reported from Johnstown, Pa., that W. Horace Rose, Percy Allen Rose and Forest Rose of that city have secured control of the various properties of the Savage Firebrick Company, and will double the capacities of the manufacturing plants that have been maintained at Meyersdale and Hyndmon, Pa., thus necessitating the purchase of considerable machinery.

The Bonney-Floyd Company, Columbus, Ohio, whose business slowed down somewhat during the summer, in common with that of other foundries in the district, is looking forward to a lively demand for steel castings this fall.

An addition is being made to the planing mill of Pence & Geyer's furniture factory at Hillsboro, Ohio, and some new machinery will be installed.

The Franklin Steel Company, Franklin, Pa., is making a specialty of tripartite steel poles, used for supporting overhead wires and cables. The demand for material of this class is steadily increasing. One of the extending fields of application is railroad signal service.

The Harris Pump & Supply Company, Pittsburgh, is selling agent here for the various types of pumps manufactured by the Deming Company, Salem, Ohio, which are being largely installed in this district.

The large manufacturing plant which formerly belonged to the Keystone Bridge Works, but has latterly been the property of the American Bridge Company, is being taken possession of by the New Method Art Glass Company, which will remove from its present location. The main is a three-story structure, 40 x 225 ft., with a smaller one adjoining, and additional ground has been leased by the new occupants for another factory, 40 x 150 ft. Some new equipment will be needed for the works, as remodeled and extended, but the details of this have not yet been fully determind upon. The New Method Art Glass Company was originally located at Wilkinsburg, Pa., and now occupies quarters in Pittsburgh at 3117 Pennsylvania avenue.

The Morgan Engineering Company, Alliance, Ohio, is reported to be deriving a good share of its business at present from the Pittsburgh district. The company's offices here are in the Frick Building.

The Best Mfg. Company, Pittsburgh, in addition to the manufacture of its various specialties, which include adjustable wedge gate valves, is taking complete contracts to furnish and install the piping for power plants designed for any service.

The Willetts Company, Pittsburgh, has commenced work at Fairmont, W. Va., on a large new manufacturing plant for the production of clay goods used in the glassmaking industry. All of the machinery and handling equipment will be motor driven. It is expected that the plant will require nearly a year to build, and purchases of the apparatus needed will be made gradually within that period.

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The following contracts for the new 2400 hp. boiler plant of the Diamond State Fibre Company, at Bridgeport, Pa., have been placed by F. W. Dean of Boston, the company's engineer: Building to Frank R. Heavner, Norristown, Pa.; boilers to the Bigelow Company, New Haven, Conn.; induced draft and economizer to the Green Fuel Economizer Company, and water heater and purifier, a Cochrane, to the Harrison Safety Boiler Works.

The contract for the coal conveying machinery has not yet been placed.

The Pittsburgh Feed Water Heater Company, Pittsburgh, has received a contract for two 30,000-hp. horizontal open type water heaters for the Brunots Island power house of the Pittsburgh Railways Company, at Pittsburgh. The heaters will weigh about 50 tons each and are said to be the largest of their type ever built in this country. They are expected to be installed in October and will have all improvements embodied in similar type heaters of smaller capacity.

Detroit

DETROIT, MICH., September 6, 1910.

Sales of both new and second-hand machine tools, foundry equipment, power units, electric motors, &c., have increased somewhat within the past week, and it looks now as though the fall buying movement had definitely set in, although still subject, of course, to occasional lapses. Dealers have also been cheered by further announcements of new factory building and improvements in existing plants, which are again becoming numerous, as indicated in the following items. Others, which are known to be in contemplation, will be definitely announced before the end of the present month, and there are enough such projects to exert a very considerable influence upon the future of the market. Both this week and last the feeling that has attended primary elections all through the State has been a disturbing factor, so far as current business is concerned; but it will all be over shortly and there seems to be nothing further in sight to prevent a steady improvement in industrial operations of all kinds. The automobile companies are maturing or readjusting their plans for the coming season and there will be more buying for this account in the near future. Despite reports to the contrary, the general policy of expansion decided upon some time ago has experienced no serious setback, and, subject to certain changes made desirable by better shop methods recently inaugurated, it will be consistently carried forward.

Extensive improvements, involving the purchase in due course of new pumping machinery, will be made in the water works system at Marquette, Mich., where an engineering firm has been engaged by the city authorities to make recommendations and submit plans.

The Manistee Iron Works Company, Manistee, Mich., has added to its facilities for large marine repair work by the construction of a dry dock capable of holding 200-ft. steel vessels, and this part of the company's business will be extended.

The Beck Power Sprayer Company has been organized and will establish a manufacturing plant at Lansing, Mich.

The Detroit Brazing Company, Detroit, is having a steady run of business in the repairing of broken castings for machinery of all kinds, including automobile parts.

The Auto Parts Mfg. Company, Detroit, has decided upon plans for a new building that will double its present capacity. Fred C. Niedermiller of this city was recently elected secretary. The business has been rapidly extending, and it is a question whether the added facilities now provided for will be adequate to the requirements of the company's trade by the time they are completed.

The Detroit Mfg. Company, Detroit, has increased its capital stock, and it is reported that arrangements will be made in the near future for the erection of a new factory building.

G. A. Mueller is preparing plans for a new factory building, 35 x 60 ft., two stories, for the Glass Enameled Package Company on the Terminal Railroad tracks at Gratiot street, Detroit. It will be of brick construction.

The Peter Smith Heater Company, Detroit, Mich., has reached a record this season in the sale of its hot water heaters, which makes over 10,000 now in use on the principal traction systems of the country. The manufacturing facilities of the company are being gradually extended to meet the demand.

The Anderson Forge & Machine Company, Detroit, is providing for its new plant an installation of steam hammers which will handle anything from the smallest auto part work up to the heaviest forgings used for motor trucks and similar purposes.

The Horton Autoette Mfg. Company has been incorporated at Detroit for $100,000.

The Wheel Truing Brake Shoe Company, Detroit, is putting on the market a device for keeping locomotive and car wheels in trim while they are in service. This has proven a valuable adjunct of steam and electric railway equipment and the company's output is steadily increasing.

A steam hoist of small capacity, which will be displaced later on by one of larger size, is about to be installed by the New Baltic Mining Company on new ground at Houghton, Mich. Another air compressor is also being added to the power house equipment.

The Warren Motor Car Company, Detroit, is completing its large new manufacturing plant.

The W. J. Burton Sheet Metal Works, Detroit, is experiencing a very active season, having found it necessary to put on more die makers and other skilled operatives.

A three-story addition, 80 x 100 ft., equipped with machinery electrically operated, will be made to the plant of the Bay View Furniture Company, Holland, Mich., for the manufacture of extension tables. The capacity of the factory is to be doubled.

It is reported from Lansing, Mich., that the Air Cooled Motor Company of that place will add to its shop equipment.

The Rapid Motor Vehicle Company, Pontiac, Mich., is placing in commission its new power plant, which has been equipped with engine driven generating units furnished by the Allis-Chalmers Company, Milwaukee. The boilers are of the water tube type, having furnaces with automatic stokers.

One of the lines of production which the American Blower Company, Detroit, has developed to quite a large extent is the manufacture of dryers, both standard and special, for a variety of industrial purposes, including the manufacture of brick and other clay products. Anything in this line can be furnished promptly from among the company's numerous designs.

The Everett-Metzger-Flanders Company has practically concluded the purchase of land in Detroit adjoining its present plant on West Jefferson avenue, in order to provide for future extensions.

As the result of damage from a fire last week, the plant of the Cadillac Water & Light Company, Cadillac, Mich., may be remodeled for larger capacity and improved in various ways, although the generating units escaped the flames and service to industrial plants in the vicinity was only temporarily interrupted. The present equipment of the station consists of four engine driven dynamos of 500 kw. capacity.

The Barker Mfg. Company, Lansing, Mich., is offering to the trade as one of its specialties a governor pulley which can be used on an engine or line shaft to excellent advantage for a starting and speed regulator.

The first mining properties to be operated in the upper peninsula of Michigan by the New York State Steel Company are now being opened up near Iron River, Mich.

The Bryant & Berry Company, Detroit, has found this a very favorable season for the sale of propellers, which it manufactures for motor boat service. A special design has been developed that produces a very appreciable increase in speed as compared with other types, and this feature of the business gives evidence of growing into a very large industry in itself.

The Chalmers Motor Company, Detroit, has increased its capital to $3,000,000.

The equipment of the new power plant that is being installed by the Hancock Consolidated Mining Company, Hancock, Mich., includes eight 72 in. by 18 ft. firetube boilers of 150 hp., which are furnished by the Kewanee Boiler Company, Kewanee, Ill.

St. Louis

ST. LOUIS, September 5, 1910.

Numerous small manufacturing shops are getting ready to start up in this field. This is indicated by the investigation of machine tools being made by the parties interested at the various machine tool houses each day.

The Sayman Company, St. Louis, manufacturer of medicated soap, will erect a new factory on Franklin avenue to cost $75,000. The new building will have about 155,000 sq. ft. It will be equipped with modern machinery, including a printing department.

The Dalton Adding Machine Company, Poplar Bluff, Mo., is very busy and contemplates some extensive improvements. It has considerable machinery now on order.

The Duncan Foundry & Machine Company, Alton, Ill., is quite busy. It manufactures coal machine equipment.

The United Railways Company is operating its shops continuously. Besides keeping up the repairs on the large number of cars in service it is completing seven new all-steel street cars per month.

The Scullin-Gallagher Iron & Steel Company, St. Louis,

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recently placed an order for a 10-ton three-motor traveling crane.

The St. Louis Cordage Company, which operates a large hemp rope factory, finds business satisfactory for this season.

The Moning Shoe Company, Marshall, Mo., has been incorporated; capital stock, $80,000; Hugo Moning, president. The site for a factory has been purchased.

P. P. Buddy, St. Joseph, Mo., has been awarded the contract for the erection of the King foundry and the Specialty Shoe Repair Machinery Company's building in Industria, Mo.

It is reported that the Lanyon Zinc Company's smelters, for 14 years in operation at Iola, Kan., are to be removed to Springfield, Ill., on account of the shortage of gas for fuel; also that the acid works of the U. S. Zinc & Chemical Company are to be removed from Iola to Kansas City, Mo., from the same cause.

The plant of the Central Box Board factory at Sterling, Ill., was partially destroyed by fire August 31, entailing a loss of nearly $100,000.

The Union Pacific Railroad will erect a new roundhouse at Belleville, Kan.

The Ringen Stove Company, St. Louis, is now preparing to erect a plant to cover 8 acres of ground, recently purchased on Chouteau avenue. The plant will include a two-story building, 65 x 720 ft., and when completed will have a daily capacity of 1500 stoves.

The Davis Expansion Boring Tool Company, 3914 North Broadway, St. Louis, Mo., will begin in the near future the erection of a new plant. The expenditure which will be made for new tools is estimated at $80,000 to $100,000.

The South

CHATTANOOGA, TENN., September 5, 1910.

The machinery trade in nearly all localities of the South, so far as can be estimated from reports made by representatives of leading manufacturers and jobbers, is beginning to pick up again to a noteworthy degree. There has been no large volume of sales apparent lately, but numerous inquiries are coming in to dealers at the principal centers of distribution, and some manufacturers are closing contracts for considerable work that will be used as a filler during the late fall and winter months. Shops, foundries, fabricating plants, planing mills, furniture factories and other establishments in related lines are expected to buy just as freely this fall as they did a year ago, and the probability is that their aggregate requirements in the way of new equipment, as well as material, will be larger than in any previous season.

Important improvements, including the probable purchase of a new pumping unit of large capacity, will be made in the water works system at Aiken, S. C.

Some cargo handling machinery may be required in connection with a new dock which the New Orleans, Mobile & Chicago Railroad, Mobile, Ala., is planning to build in the vicinity of that city.

The Moniac Chemical Company is building a new plant at Jacksonville, Fla.

Preparations are under way to replace the plant of the Gulf, Red Cedar Company, Lebanon, Tenn., which recently burned. New power and operating equipment will be required.

The Atlanta Car Wheel & Mfg. Company, Atlanta, Ga., is offering, in place of the old style wheel for electric traction service, one of a new reinforced spoke pattern, which is especially adapted to high speeds. By means of a method of uniform chilling, which extends for some distance beneath the surface, great durability and long wear are insured.

The woodworking plants at Glenmary, Tenn., of the Tennessee Lumber & Coal Company, Nashville, Tenn., which were recently destroyed by fire, will be rebuilt and equipped with modern machinery.

The W. E. Caldwell Company, Louisville, Ky., has found one excellent source of demand for its elevated steel tanks, sprinklers, &c., in connection with fire protection systems for Southern mills. Similar installations have also been made for isolated plants in other parts of the country and in many instances the effect upon insurance rates has been very considerable.

Among the power generating plants in the South equipped by the Westinghouse Electric & Mfg. Company, one which has been widely visited by engineers and users of power machinery is that of the Atlantic Coast Line, which furnishes current for motors driving tools in the shops of the road at Waycross, Ga. This includes two steam turbine units generating alternating current and rotary converters that change it to direct current for operating the machinery.

The Casey-Hedges Company, Chattanooga, Tenn., is making quite a feature this season of its patent steel boiler settings, which are being called for more and more as the advantages of this construction come to be understood in various parts of the country, including the South.

The Tellico River Power Company, Tellico Plains, Tenn., is preparing for the construction of a hydroelectric power plant of 4000 to 5000 kw. capacity, with reinforced concrete flume, steel penstock and alternating current generator units.

The American Brake Shoe & Foundry Company, through its Chattanooga branch, is selling brake shoes of the special steel back type to quite a number of industrial roads in the South, as well as the regular freight lines, particularly for use on heavy grades.

The Frost Pump Company, Bristol, Va., has been incorporated with $25,000 capital stock to manufacture the Frost patent pneumatic displacement pumps. The buildings are in course of construction and all necessary equipment has been purchased. Frank Miller, Bradford, Va., is president.

Steps are being taken by the citizens of Abbeville, La., toward organizing a stock company to build a sugar factory. About $20,000 has already been subscribed.

Milwaukee

MILWAUKEE, WIS., September 5, 1910.

Trade here is still somewhat slow, compared with what it was during the spring and first two months of summer, and there has recently been more uncertainty expressed with reference to fall buying than is customary at this season of the year. A good deal of business is in prospect, both locally and from other sections of the continent, as well as abroad; but here it involves improvements or needed changes in established plants rather than new construction, and final decisions in relation to these are being quite generally held in abeyance until the trend of autumn business can be observed.

W. A. Brazeau, Grand Rapids, Wis., who has been long identified with the industrials of this State, was recently elected secretary and general manager of the newly organized Inland Empire Paper Company, which will erect a large electrically driven manufacturing plant at Coeur d'Alene, Idaho. Wilbur S. Yearsley, Spokane, Wash., is president of the company. A second mill is to be built on the Spokane River at a point not yet definitely determined. The company will probably generate its own power by means of hydroelectric plants.

The Reliance Iron & Engine Company, Racine, Wis., has been crowded to capacity this summer in the production of the gasoline engines, which it manufactures under the trade name of Sta-Rite, and for the coming season a considerable increase in shop facilities is reported to be planned.

An addition, 80 x 144 ft., will be made to the Commerce street power station of the Milwaukee Electric Railway & Light Company, to provide room for the installation of steam turbine units. A new substation on the South Side of Milwaukee, 40 x 57 ft., is also to be erected.

The boiler shop of the J. I. Case Threshing Machine Company, Racine, Wis., is to be extended by an addition, 100 x 100 ft., of brick and steel construction. Information relating to the equipment needed can be obtained only by direct inquiry.

Peter Arinovitz, Marinette, Wis., is putting up a two-story shop, 30 x 60 ft., for use in rebuilding and repairing second-hand machinery, which he handles in addition to a large trade in metals.

A low pressure boiler plant will be installed in the mill of the Ashland Paper Company, Ashland, Wis., whose plans for a new manufacturing establishment were recently mentioned, to furnish steam for various uses in connection with paper making. Power for driving the machinery by means of electric motors will be purchased from the Ashland Light, Power & Street Railway Company.

The Lyons Boiler Works, De Pere, Wis., will install two boilers of 300 hp. each in the power plant of the Buckstaff-Edwards Company, Oshkosh, Wis.

The Lipman Mfg. Company, Beloit, Wis., is putting out a line of small rotary pumps for circulating water and oil in connection with internal combustion engines and other purposes. The automobile trade is taking a considerable percentage of the company's product.

Among the requirements of the Lignum Chemical Company for its new plant at Marinette, Wis., will be a battery of boilers and a line of alternating current motors. It is probable that the electric power for operating the plant will be obtained from the Menominee & Marinette Light & Traction Company.

The Smith Gas Power Company, Lexington, Ohio, has been given the contract for a producer plant to be installed in connection with the Brodesser Motor Truck Company's

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new factory at Juneau, Wis. The purchase of an 85-hp. gas engine from the Rathbun-Jones Engineering Company, Toledo, Ohio, has also been decided upon by this company.

An electric motor of 150 hp. will be installed by the John P. Dousman Milling Company, De Pere, Wis., to run its elevator.

The State Board of Control, Madison, Wis., will take bids until September 12 on a deep well turbine pump for a 17-in. well.

The McDonough Mfg. Company, Eau Claire, Wis., is putting on the market a type of resaw known as the Junior, which is especially adapted to service in planing mills, box factories and other woodworking plants where a speed of 100 to 125 ft. per minute is sufficient. It is claimed for this tool that it is a strong, efficient, practical machine, and that it can be handled and adjusted more quickly than any other on the market.

The Milwaukee Electric Railway & Light Company has started the foundation work on 15 shops and a large power plant to be used in building steel frame cars for its system.

The Raymond Mfg. Company, Marinette, Wis., has sold to the Newport Mining Company, Milwaukee, a number of log handling machines to be used in connection with timbering for its mine in upper Michigan.

The Hartmann, Nelson & Zapfe Company, operating a machine shop and boiler repair works at Green Bay, Wis., have bought a manufacturing plant there, and will raze the buildings in order to erect new shops on the site. The equipment of the latter will include forging machinery and tools for heavy marine work, besides what it is needed for the company's other lines.

The A. Ewald Machine Works, Oakfield, Wis., is making a specialty of a steel spring friction pulley for use with light running machinery.

A new power plant and pump station, with an addition to its woodworking factory, will be made by the Anson-Gilkey-Hurd Company, Merrill, Wis. The machinery required is understood to have been principally ordered.

The John Lauson Mfg. Company, New Holstein, Wis., in addition to its regular line of gasoline engines, which are built in sizes up to 30 hp., is putting out a 1 hp. unit for small power and pumping service that is proving very popular with the trade.

Two new stories are being added to the plant of the Racine Stool Company, Racine, Wis.

The Elderon Light & Power Company has been organized at Elderon, Wis., to establish a public service plant. The installation of an electric generating set will be considered shortly.

The contract for building and equipping a municipal electric power plant at Crandon, Wis., has been let to the Langstadt-Meyer Construction & Supply Company, Appleton, Wis.

An addition is to be made to the factory of the Racine Auto Top Company, Racine, Wis.

The Beaver Dam Malleable Iron Company, Beaver Dam, Wis., is busy on orders for railroad companies, including the tie plates and rail braces which it manufactures each season in considerable quantity.

Two 8-in. pumps for dewatering are being installed for the Vinegar Hill Mining Company, at Buncombe, Wis., by the Galena Iron Works, Galena, Ill.

The engineering firm of D. C. & William B. Jackson of Boston and Chicago, is planning some improvements for the Janesville, Electric Company, Janesville, Wis.

The Southwest

KANSAS CITY, MO., September 5, 1910.

The influence of funds made available in the agricultural districts as the result of crops marketed during August is beginning to be felt in the machinery market. Numerous owners of local manufacturing plants, including machine shops and foundries, who have interests in farms under cultivation, are now ready to consider closing orders for new operating equipment in which they have previously hesitated to invest, and the money thus spent has a tendency to deplete the stocks of dealers. Small steam and gasoline engines, pumping outfits, electric lighting sets and apparatus of general utility are also included in the lines affected by buying orders from the interior districts. The machinery houses that during the summer depended for their sales mainly on correspondence are again starting their representatives out on the road, and a number of new agencies recently established for Eastern firms have commenced to canvass the territory for orders. There are, in fact, signs everywhere of greater activity, and by the end of this month autumn trade will undoubtedly be in full swing.

The United Zinc Company, Galena, Kan., is extending its operations in the Lehigh district. Two pumping units for dewatering have been installed on property recently acquired there, and additional machinery will be needed as development work progresses.

The Atlas Metal Works, Dallas, Texas, is making gas machines one of its specialties. The outlook for fall trade in this line is fairly good, and there will probably be a good deal of buying during the next few months.

Plans are now in course of preparation for the power equipment of the St. Joseph & Savannah Interurban Railway, St. Joseph, Mo., the construction contract for which was recently let. Wm. P. Foster, secretary, is in charge of the work.

Bids will be taken some time this month on machinery for a municipal power and pumping plant for Oakley, Kan.

The O. K. Harry Steel Works, Dallas, Texas, is turning out a good deal of tank work and corrugated material for roofing, siding, &c., for which the activity in new building has created a widespread demand.

The Thumb Butte Mining Company, Prescott, Ariz., is completing development work which will lead to the purchase before long of additional operating machinery.

The city of Maysville, Okla., has decided to install machinery for a pumping station, but it will be some weeks before specifications are ready.

A complete stock of power transmission machinery for Southwestern trade is carried at Enterprise, Kan., by the Philip Smith Mfg. Company, Sidney, Ohio, which makes a specialty of that type of apparatus.

Two large centrifugal pumps have been installed by the Chino Copper Company, Santa Rita, Ariz., for supplying water to its mill from wells sunk in the vicinity, and with the completion of a larger supply line the capacity of this plant will be increased.

Bids for the equipment of a new electric plant to replace the one that burned some weeks ago will be taken in the near future at McPherson, Kan., by the municipal authorities. Gas engine driven units will probably be selected for the service.

The contract for a new steel bridge at Ottawa, Kan., has been awarded the Canton Bridge Company, Canton, Ohio.

Plans are in course of preparation for a pumping plant to be installed by the city of Onaga, Kan., but the details have not yet been fully decided upon.

An electric light plant and water works will be built at Hamburg, Ark., to cost about $40,000. The water works will have about 5 miles of mains.

The Southern Pacific Railroad Company's pumping plant and water tank at Sanderson, Texas, were destroyed by fire August 23.

The Bowser Drilling Company, Houston, Texas, has been incorporated; capital stock, $5000; incorporators—C. C. Bowser, Erwin Smith and Claude Smith.

The Farmers' Union gin in San Marcos, Texas, was destroyed by fire August 31, entailing a loss of $12,000. It will be rebuilt of brick and concrete and made as nearly fireproof as possible.

A sugar mill will be built at Harlington, Texas, to cost about $400,000, and have a capacity of 400 tons daily. Lon C. Hill, a local capitalist, is largely interested, and is looking after the construction of the mill.

The Boardman Company, Oklahoma City, Okla., has been incorporated; capital stock, $20,000; incorporators—John R. Boardman, John Fleisman and Charles E. Rice, to engage in the manufacture and sale of metals and machinery.

The Northwest

ST. PAUL, MINN., September 5, 1910.

A heavier volume of inquiries is noted by representative manufacturers, jobbers and dealers of Minnesota and the Dakotas, while from all of the mining districts of the Northwest that escaped damage from forest fires the reports are most encouraging. Development work undertaken in the spring or early summer has, in many instances, reached the stage where purchases of additional operating machinery are necessitated, and for properties that have been on a paying basis the erection of crushing and concentrating mills, roasting or smelting furnaces, refining plants, power installations, &c., are contemplated. It is evident that trade in the western part of this territory will form a larger percentage during the coming fall, than ever before, of the total amount obtainable in all sections. Therefore, with the growth of local industries at this end, the outlook at present is very bright.

An addition, 40 x 130 ft., is to be made to the factory of Stott & Son, at Winona, Minn.

The Fargo Bridge & Iron Company, Fargo, N. D., has taken the contract for seven steel bridges to be erected in the vicinity of Mandan, N. D.

The Boston & Corbin Mining Company has in operation

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at Corbin, Mont., an electric hoist built by the Wellman-Seaver-Morgan Company, Cleveland, Ohio, and is pushing development work. The erection of a concentrating plant is contemplated for the coming season.

The Northwestern Development Company, Wallace, Idaho, in which Edw. Donlan is principally intersted, has secured title by court proceedings to the water power at Thompson Falls and is planning to construct a hydro-electric plant with an ultimate capacity of 24,000 kw.

It has been practically decided by the authorities to add a motor-driven centrifugal pumpt of 20,000,000 gal. daily capacity to the water works system of Minnéapolis. Bids, however, are not likely to be taken for some weeks yet.

The Gunther Machinery Company, Minneapolis, which has built up a large trade in both new and used machinery for metal or woodworking, finds prospects for the fall season excellent. There is every evidence that a widespread demand will be developed within the next few months.

The machinery for the new mill of the C. A. Smith Lumber & Mfg. Company, at Marshfield, Ore., which was principally furnished by the Diamond Iron Works, Minneapolis, has just been put in operation. This completes the largest plant of its kind on the Pacific Coast.

The contract for an elevated steel tank, to be used in the city water system at Duluth, Minn., has been taken by the St. Paul Foundry Company, St. Paul, Minn.

The Gates-Osborne Mfg. Company, Marshalltown, Iowa, manufacturer of automobile and buggy tops, will move to Indianapolis, Ind., where it has leased manufacturing quarters. Frank E. Gates is at the head of the company.

The Farther Central West

OMAHA, NEB., September 5, 1910.

While autumn trade does not seem to be opening very strong there has been some increase in buying within the past week or ten days. The tone of the market shows decided improvement, and there is a more hopeful feeling among dealers in relation to prospects for the immediate future. When the first rush of grain to market has subsided, which will be about October 1 or 15, orders from the interior districts are likely to come in freely for manufactured articles of all kinds, thereby stimulating the business of local shops and factories and creating a much greater purchasing power than now exists.

From Des Moines, Iowa, it is reported that the Des Moines Silo Mfg. Company is erecting an additional factory building, 50 x 200 ft., for the production of ensilage cutters.

The Monticello Electric Light Company, Monticello, Iowa, has acquired the site for a dam and hydro-electric power plant. Details of the equipment contemplated have not yet been decided upon and may not be for some time.

The Waterloo Drop Forge Company, Waterloo, Iowa, is making a specialty of forgings and tools used in the manufacture of internal combustion motors, having a heavy demand for its product within a short distance of the plant.

The Cushman Motor Works, Lincoln, Neb., are supplying to the trade a four-cycle gas engine of 3 hp., equipped with an automatic governor, which can be used for driving small electric dynamos or applied to any similar service, including the operation of agricultural machinery.

An electric generating set and other machinery will probably be purchased in the near future for a municipal power plant at Muscatine, Iowa, where the subject is under consideration by the authorities.

The Hart-Parr Company, Charles City, Iowa, has had a very prosperous year thus far in the manufacture of gas traction engines, which can be operated on gasoline, oil or alcohol fuel. The use of these machines is increasing in all parts of the United States, and particularly in the West.

Fairbanks, Morse & Co., through their Denver office, have taken the contract for installing a water works system at Johnstown, Colo.

H. R. Mosnat has been granted a franchise to erect a gas generating plant and distribution system at Belle Plaine, Iowa.

The Wm. Galloway Company, which has a large plant at Waterloo, Iowa, for the manufacture of gasoline engines, is making extensive use of automatic machinery, thereby enabling it, with the purchase of material in large quantities, to bring the cost of production per unit to a very low figure, as compared with that attainable in ordinary shop practice. This is one of the best equipped and managed plants of its kind in the country.

The repair shops, roundhouse, &c., of the Chicago & Northwestern Railway Company, at Chadron, Neb., which were burned some time ago, are being rebuilt.

The United Hydro Power & Electric Company, Georgetown, Colo., will supply current for operating motors in a new 250-ton concentrating plant to be built for the Frontenac Consolidated Mining Company, near Central City, Colo.

The Des Moines Bridge & Iron Company, Des Moines, Iowa, has received the contract for an elevated steel tank to be erected for the city of Charleston, Ill.

Victor Speer & Co., Cedar Falls, Iowa, are putting on the market a cable winding and haulage machine, driven by a gasoline engine, which has been widely sold this season for contractors' service in building, road-making, &c., and for a variety of similar service.

The Davenport Locomotive Works, Davenport, Iowa, will erect a brick and steel power house addition. It is completing two other buildings, a blacksmith shop and a machine shop.

The Muscatine Pearl Company, Muscatine, Iowa, will erect a branch cutting plant at Maquoketa, Iowa; about 50 men will be employed.

The Clinton Brewing Company, Clinton, Iowa, will shortly commence the erection of an extensive bottling plant to be equipped with all modern appliances and machinery.

The old blacksmith shop of the Davenport Locomotive Works, Davenport, Iowa, which was to have been used by the Andrew Chemical Company, together with a part of the carpenter and pattern shop, was destroyed by fire August 29. The loss is estimated at $15,000.

The Chicago & Northwestern Railway Company will extend its roundhouse at Belle Plaine, Iowa.

The plant of the Ottumwa Box Car Loader Company, Ottumwa, Iowa, was destroyed by fire August 31, entailing a loss of about $60,000. It was insured for $20,000. A new plant of modern steel construction will be built. The company employs 150 men. The machinery was badly damaged and most of it will have to be replaced.

The Omaha Structural Steel Works, Omaha, Neb., has increased its authorized capital from $25,000 to $200,000, of which $100,000 is reported paid in. The principal stockholders are John W. Towle, C. A. Pratt and R. A. Leussler of Omaha, and John L. Lichter of St. Louis, Mo. A new plant will be designed and erected by Lichter & Jens, St. Louis, occupying a site of 5 or 6 acres.

The North Pacific Coast

TACOMA, WASH., September 2, 1910.

Increasing activity, as recently foreshadowed, is the principal feature of trade at present all along the North coast; and from interior points, as far as the Panhandle of Idaho, there has been developing of late a steady flow of inquiries for machinery and supplies. To some extent purchases for important projects are still deferred; but a number of these are approaching the stage where contracts for equipment will need to be placed, and, while it may take a month or two longer to force buying on that account, it will be done in proportionately greater volume when the time comes. Meanwhile, current business, based on the ordinary operation and growth of the multitude of local industries, is keeping the market in a healthy condition. All of the machine shops, foundries, structural plants, repair works, &c., are reasonably busy on orders taken during the past month or even earlier. Alaskan trade also continues to be an appreciable factor in the situation.

The West Coast Steel Works, recently organized by interests identified with the West Coast Wagon Works of this city, has established a steel structural and fabricating plant in connection with the latter, but will build shops of the most modern design, electrically operated, on a new site that has been acquired. Definite information can be obtained in due course by direct inquiry.

The timber cutting plant, planing mill, shingle mill, kilns, warehouses and docks of E. J. McNeeley & Co., Tacoma, which burned last week, are expected locally to be rebuilt this fall. As the fire started in the boiler room the power plant was also destroyed, so that entire reconstruction will be necessary. The company will probably install steam turbine units and drive its machinery in future by means of electric motors.

H. H. Plummer, with office in the Pacific Building, Seattle, is in charge of the sales department on the Pacific Coast of Baxter D. Whitney & Son, Winchendon, Mass. For the first half of the year there was a good market in this section for planers of that firm's manufacture, and, with the resumption of buying during the fall, the season will undoubtedly close strong.

The Alaska Treadwell Gold Mining Company is installing the machinery in its new power plant, near Juneau, Alaska. By the opening of another year further purchases on this account will be necessary.

The plant of the Wm. Musser Lumber & Mfg. Company, Spokane, Wash., will probably be rebuilt for extended capacity and a complete electric power and lighting system installed.

An interesting gravity cable system for handling material on steep ground with the aid of a 9½ x 11 in. engine

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built by the Willamette Iron & Steel Works, Portland, was described by F. E. Newby of Hood River, Ore., in a paper read before the Pacific Logging Congress.

The Wheeler-Reese Company, Tacoma, is reported to be having plans prepared for a new timber cutting plant, with electric motor drive, at Lake Head, Wash., to replace the one that burned.

Owing to a typographical error, the capacity of the Coquille River Electric Company's plant at Coquille, Ore., was stated last week as 15 kw. This should be 150 kw.

As the forerunner of more important improvements, an air compressor of larger capacity than the one heretofore in service will be installed at the Juneau, Alaska, mine of the California & Nevada Copper Company. An ore reduction plant of 100 stamps, equipped with the most modern machinery, is to be completed by spring.

The Sumner Iron Works, Everett, Wash., is manufacturing an all-steel carriage for sawmill work. Among recent installations of this apparatus is one made by the Western Lumber Company, Aberdeen, Wash.

The construction of water works has been decided upon at Jacksonville, Ore., but very little equipment will be required, as a gravity system is feasible.

The Heffernan Engine Works, Seattle, Wash., has added to its facilities for large marine work by the purchase of the marine railway of the Seattle Shipyards' Company, which it will move to the East Waterways, a large tract of tide land recently acquired. The company's plans embrace a complete repair and building plant with large modern shops. The floating dock is 100 x 385 ft., having a capacity of 8000 tons and the marine ways is 56 x 250 ft., with a capacity of 4000 tons.

San Francisco

SAN FRANCISCO, August 31, 1910.

A favorable indication regarding the outlook in California is found in the increased earnings of public service corporations. For example, the net earnings of the Pacific Gas & Electric Company for the six months ending June 30, were $1,635,385, compared with $2,812,403 for the entire year ending June 30, 1909, and the net earnings of the United Railroads of San Francisco for the first half of 1910 showed an increase of $92,342 over those of the same period last year. The opening of the Western Pacific Railroad to freight and passenger traffic will mean a considerable increase in the demand for machinery, both for the railroad itself and for the large territory which it opens to exploitation.

A number of railroads in California are completing their new construction for the year and are now getting into the market for additional rolling stock and supplies, orders for which are being placed every day. The United Railroads of San Francisco is preparing to introduce a new type of steel cars, and has placed an initial order for 80 of them, while numerous purchases are being made for interurban roads in the interior.

Machine tools have not begun to move to any extent in the local market, though buying for other parts of the State is gradually increasing. Some dealers are hampered by the impossibility of getting prompt deliveries, though the majority have sufficient stock on hand to meet current requirements of standard types. Local manufacturers of machinery are now feeling the effects of the eight-hour schedule very strongly, and a slight curtailment of output is noted in some lines which have formerly been active. The demand for pumping machinery remains quite strong, but comparatively little new work has been taken on recently by local manufacturers in this line.

Both dealers and manufacturers report a quiet market for mining machinery, though there are some inquiries for gold dredges, and a number of large rock crushing outfits have been ordered within the last few weeks. Road and construction machinery is still in demand. More business is coming up in woodworking machinery. Electrical equipment is fairly active, with a strong demand for motors.

The Geo. E. Dow Pumping Engine Company, San Francisco, is building a large number of Underwriter fire pumps, to be driven by both steam and electricity, for which there is considerable demand at present. Most of these pumps are of 750 to 1000 gal. per minute capacity. This company is shipping a carload of pumping machinery to the Newport News Shipbuilding Company and will make a similar shipment next week.

The machinery is now arriving at the new plant of the Pacific Coast Steel Company at South San Francisco, and the plant is to start work about the first of next year. The principal features of the equipment are two open hearth basic furnaces, an 18-in. mill and a 10-in. mill. Bars and small structural shapes will be rolled.

The opening of the Columbia Steel Company's new plant at Black Diamond, Cal., has been postponed from September 1 to about the middle of October, owing to delay in installing some of the equipment.

The Western Pipe & Steel Company is working on its new plant at Richmond, Cal., which will be ready for operation by September 15. The machinery is being moved over from San Francisco, and in addition new machines are being installed to handle plates up to 1¼ in. thick. The company has new contracts covering its entire output for several months.

The Pacific Portland Cement Company has purchased one No. 9 and two No. 6 McCully crushers for its plant at Cement, Cal., and is putting in a tramway, the entire plant being operated by electric power.

The J. J. Belser Company, Honolulu, T. H., has ordered a No. 7½ McCully crusher, which is the largest machine of this type in the islands. This company is also installing a large set of roll crushers, elevators and screens and a steam power plant.

The Eccles & Smith Company, San Francisco, recently took up the agency for Terry core drills, and is getting them well established in this market.

The Yuba Construction Company, Marysville, Cal., which has built several large gold dredging plants recently, is preparing to double the size of its shops.

The Chico Iron Works, M. L. Mery, proprietor, located for 38 years at Chico, Cal., is to be removed to Oroville, Cal.

The Pacific Hardware & Steel Company has leased an additional warehouse on Seventh street, between Bryant and Brannan. A building at the corner of Townsend and Crook streets has been leased by the Johnson Ball Bearing Water Wheel Company.

The Eureka Well Supply Company has been incorporated at Bakersfield, Cal., with a capital stock of $50,000, by I. Sanderson, H. M. Tomson, G. T. Nighbert and N. McDonald.

T. H. Benton, whose large sawmill at Redding, Cal., was burned recently, is preparing to replace his equipment.

The Visalia City Water Company, Visalia, Cal., is planning to install a new pumping plant.

P. K. Wood of the P. K. Wood Pump Company, Los Angeles, has invented and is putting on the market a new pump for handling crude petroleum.

The Bulger Lock Coupling Company has been incorporated in San Francisco, with a capital stock of $1,000,000, by C. A. Gibson, J. K. Bulger, J. D. Spreckels, Jr., A. L. Gage and W. D. K. Wilson.

The Cyclops Iron Works, San Francisco, has a contract for an ice and refrigerating plant for the city of Sacramento, Cal.

Geo. L. Moselle, representing the United States Iron & Steel Company of Los Angeles, has been looking for a site for a smelter in San Francisco or Oakland.

It is reported that the Pacific Coast Steamship Company may place orders for a new steamer in the near future.

The Associated Pipe Line Company has purchased a tract of land at Los Banos, Cal., where it is preparing to install a large oil pumping station.

The Western Grain & Sugar Products Company has purchased a large building at Crockett, Cal., and will install machinery and equipment to cost about $200,000.

The Choix Consolidated Mining Company, Los Angeles, has placed a $50,000-contract with the Mill & Smelter Engineering Company of New York for a smelter to be constructed at its mines in Mexico.

The Baker-Smith Machine Company has been incorporated at San Diego, Cal., with a capital stock of $10,000, by Robert and Fred Baker and F. and S. Smith.

The San Diego Electric Railway Company has secured a permit to erect a temporary machine shop in San Diego, Cal., pending the completion of its permanent shop buildings.

The R. Bancroft & Sons Company is preparing to establish a factory at Merced, Cal., for the manufacture of gas engines, pumps and agricultural machinery.

The city of Los Angeles will receive bids September 26 for crusher plates for the municipal cement mills.

The Union Dredging Company is planning to build several gold dredges at a cost of about $100,000 each, for working its property near Folsom, Cal.

The Portland Cement Company is installing a 3-mile aerial tramway and other machinery for a new plant near Auburn, Cal.

Government Purchases

WASHINGTON, D. C., September 6, 1910.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids September 10 for additions to power plant and distributing systems, Naval Hospital, Annapolis, Md.

The Isthmian Canal Commission, circular 603, calls for

bids to be opened September 20 for electric motors, punches, dies, &c.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids August 30 for the following:

Class 11.—One high speed forging press—Bidder 175, United Engineering & Foundry Company, Pittsburgh, Pa., $9075.

Class 91.—One steam locomotive crane—Bidder 15, Browning Engineering Company, Cleveland, Ohio, $12,875; 204, Industrial Works, Bay City, Mich., $11,495.

Class 101.—Electrical machinery—Bidder 75, General Electric Company, Schenectady, N. Y., $12,092 and $12,972; 158, B. F. Sturtevant Company, Hyde Park, Mass., $8239; 167, Terry Steam Turbine Company, New York, $10,615.

Class 181.—One turbo-generating set—Bidder 75, General Electric Company, Schenectady, N. Y., $900.25; 158, B. F. Sturtevant Company, Hyde Park, Mass., $597.50; 167, Terry Steam Turbine Company, New York, $775.

July Exports and Imports of Iron and Steel

According to the July report of the Bureau of Statistics of the Department of Commerce and Labor the total value of the imports of iron and steel and manufactures thereof showed a considerable gain as compared with June, while the exports slightly diminished. The value of the July exports, not including iron ore, was $16,108,102, against $16,503,204 in June, while the value of similar imports was $3,656,395 in July, against $3,068,184 in June.

The exports of commodities for which quantities are given totaled 128,055 gross tons in July, against 120,596 tons in June, 135,344 tons in May, 117,918 tons in April and 124,753 tons in March. The details of the exports of such commodities for July and for the current calendar year ending with July are as follows, compared with the corresponding periods of the previous year:

Exports of Iron and Steel.

	July,		Seven mos. ending July,	
	1910.	1909.	1910.	1909
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	17,504	7,885	59,213	31,782
Scrap	1,090	2,570	12,929	21,321
Bar iron	1,826	992	11,340	8,001
Wire rods	1,024	589	14,625	9,390
Steel bars	10,457	6,691	58,388	39,610
Billets, Blooms, &c.	126	13,971	7,657	74,810
Steel rails	28,568	18,973	219,200	139,567
Iron sheets and plates	7,105	4,675	61,347	38,627
Steel sheets and plates	11,020	7,352	91,648	53,292
Tin and terne plates	372	1,267	7,056	5,596
Structural iron and steel	14,028	8,090	89,042	53,706
Barb wire	5,590	7,068	42,380	39,649
Wire	8,720	7,135	54,651	50,618
Cut nails	560	1,021	3,804	5,383
Wire nails	4,723	1,024	25,568	16,126
All other nails, including tacks	891	683	5,394	4,279
Pipe fittings	14,451	10,759	88,559	2,232
Totals	128,055	100,745	852,801	593,989

The imports of commodities for which quantities are given totaled 42,326 gross tons in July, as compared with 31,010 tons in June, 45,021 tons in May, 51,438 tons in April and 57,150 tons in March. The details of such imports for July and for the current calendar year ending with July, as compared with the corresponding periods of the previous years, are as follows:

Imports of Iron and Steel.

	July,		Seven mos. ending July,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	19,865	17,899	139,918	76,800
Scrap	3,033	2	60,389	2,252
Bar iron	3,517	1,418	25,528	8,563
Billets, bars and steel forms n.e.s.	3,283	2,711	27,594	9,084
Sheets and plates	302	304	4,073	1,943
Tin and terne plates	10,790	5,160	47,010	34,970
Wire rods	1,736	680	12,598	6,368
Totals	42,326	28,174	317,110	139,980

The imports of iron ore in July were 248,810 gross tons, against 193,415 tons in June, 240,833 tons in May, 206,135 tons in April this year, and 172,316 tons in the month of July, 1909. The total importations of iron ore for the seven months ending with July were 1,508,076 gross tons, against 744,863 tons in the corresponding period of last year. Of the July imports of iron ore 93,850 tons came from Cuba, 48,332 tons from Sweden, 38,566 tons from Spain, 10,507 tons from Canada and 57,555 tons from other countries.

The total value of the exports of iron and steel and manufactures thereof, not including ore, for the seven months ending with July, was $112,519,587, against $86,819,465 in the corresponding period of last year. Similar imports were, respectively, $24,285,808 and $15,597,523.

The Population of Latin America

Consul Frederic W. Goding of Montevideo, has compiled the following statistics from latest available sources covering Latin-American population:

Country.	Population.	Area, square miles.	Population, square miles.
Brazil	19,910,646	3,218,130	6.2
Mexico	13,607,259	767,000	17.7
Argentina	6,805,684	1,135,840	5.99
Peru	4,500,000	679,600	6.5
Colombia	4,000,000	438,436	9.0
Chile	3,249,092	291,500	11.6
Venezuela	2,591,000	593,950	4.4
Bolivia	2,267,935	709,000	3.2
Cuba	2,048,980	45,883	44.0
Guatemala	1,804,000	48,290	38.2
Salvador	1,707,000	7,225	236.0
Ecuador	1,500,000	420,000	12.0
Uruguay	1,111,758	72,210	15.4
Honduras	745,000	46,250	16.1
Paraguay	636,000	196,000	4.1
Nicaragua	600,000	49,200	12.2
Panama	360,542	32,380	11.1
Costa Rica	351,176	18,400	15.2
Totals	67,796,072	8,769,294	*26.05

* Average.

Modern Buenos Aires

Consul-General R. M. Bartleman of Buenos Aires, Argentina, furnishes the following to the Department of Commerce and Labor:

"As nearly 30 per cent. of the population of Argentina live in incorporated places of over 50,000 inhabitants, and as fully 20 per cent. of them live within a 20-mile radius of the federal capital, Buenos Aires, which is to a greater extent than any other capital in the world the concentrated center of commerce, industries, manufactures, population, and wealth of the entire country, some account of the growth of this, the fourth city in the two Americas, during the year 1909 may be of interest. However, it should never be forgotten that Buenos Aires is not the Argentine Republic, and that no one can have a true idea of that republic without a close knowledge of all the more important 24 provinces and territories. While only 12,397 buildings were erected in Buenos Aires in 1909, as against 12,542 in 1908 and 13,148 in 1907, many of them were very large, modern office buildings built of structural steel of a type utterly unknown four years ago.

"The largest hotel and the largest office building in South America were completed in Buenos Aires in 1909, both built by architects and with materials from the United States. Buenos Aires is being transformed by the new skyscrapers and the large, modern apartment houses built in the semi-French style. It is said that six years ago steam heat was almost unknown in Buenos Aires, where the winter season, though short, can be cold and damp, while to-day every new apartment house has a good system of steam heating. The old one-story houses are rapidly giving way to more modern structures. There are not enough houses to accommodate the population of a city which gains some 60,000 inhabitants a year, forming an additional reason for the constantly increasing cost of living."

Trade Publications

Forging Presses.—United Engineering & Foundry Company, Farmers' Bank Building, Pittsburgh, Pa. Circular. Concerned with high speed hydraulic forging presses, which can handle work ranging from 100 to 12,000 tons. All the sizes are controlled in the same way through a single lever and work the metal of the forgings to the center with a squeeze, not a blow. An illustrated description of these presses was printed in *The Iron Age* June 30, 1910.

Valves.—The American Valve Company, Coxsackie, N. Y. Catalogue. This is the company's 1910 catalogue, describing and illustrating the various styles of valves bearing the trade name American. These include bronze gate, globe and angle valves and iron body bronze mounted gate valves. The prices of the different sizes of valves are given in tabular form under the illustrations of the various models, and the prices for the nickel plated valves are printed on different pages from those of the standard finish.

Conveying Machinery.—Link-Belt Company, Nicetown, Philadelphia, Pa. Book No. 81. Size 6 x 9 in.; pages 96. Relates to the Peck carrier for handling coal, coke, cement and similar products. The advantages claimed for this carrier are minimum power consumption, ability to elevate and convey material in one machine, discharging material at any desired point, and silent operation. The different parts of the carrier are illustrated and described and there are a number of views of typical installations.

Electric Motors.—Rochester Electric Motor Company, Rochester, N. Y. Pamphlet. Pertains to a line of direct current motors built for constant, varying and adjustable speeds, for either constant or intermittent service. The construction of these motors is described and the text is supplemented by views of the various parts. Other illustrations show applications of these motors for driving machinery of all kinds.

Welding Joints.—Goldschmidt Thermit Company, 90 West street, New York City. Folder. Deals with the welding of butt joints with Thermit in ammonia, steam, hydraulic and compressed air pipe lines. The illustrations show a butt weld made on a 4-in. double extra heavy pipe for hydraulic service and the welding of a 1¼-in. ammonia service pipe line in a trench.

Seamless Tubing.—Ellwood Ivins Tube Works, Oak Lane Station, Philadelphia, Pa. Booklet. Lists the various kinds of seamless brass, copper and aluminum tubing made by this firm, as well as the cold drawn seamless steel variety. The various sizes are from 1-64 to 3 in. external diameter for steel tubing, 1-32 to 1 in. for the copper and brass tubing, and 1-64 to 3 in. for the aluminum tubing.

Silent Chain.—Link-Belt Company, Nicetown, Philadelphia, Pa. Booklet No. 102. Points out the advantages of using the Maximum silent chain for power transmission, which include freedom from slipping, ability to run on short centers, quietness in operation and high speed. This chain is made of stamped links of special form with hardened steel pins, removable bushings and washers. This chain runs over iron wheels having accurately cut teeth. The illustrations show the construction of the chain, its action as compared with the ordinary chain drive and a number of typical applications.

Battery Charging Rheostats.—American Electric Fuse Company, Muskegon, Mich. Bulletin No. 316. Concerned with the Allen-Bradley battery charging rheostats, which operate on the principle of compressible resistors. Regulation of the current is secured through imperfect electrical contact between graphite disks piled one upon another in an insulated dustproof metal tube and the resistance is varied by compressing or releasing the disks. The special advantages claimed are economy of space, close regulation, wide range of operation and freedom from arcing.

Electric Motors.—Triumph Electric Company, Cincinnati, Ohio. Bulletin No. 391, superseding Nos. 271 and 311. Concerned with the Type F direct-current steel frame motors, which are built in all standard sizes for 115, 230 and 500 volts. Machines smaller than 5 hp. are of the bipolar type, while the larger ones are of the multipolar design. The illustrations show the various parts of the motor, the complete machines and installations for driving various machines.

Concrete Mixers.—Eureka Machine Company, Lansing, Mich. Catalogue No. 10. Concerned with a line of concrete mixers in which it is claimed low initial and operating costs have been combined with satisfactory results. One of the special features of the machine is the possibility of varying the output to suit the conditions of the work in hand. The feeding device is automatic and will handle any kind of material used under engineering specifications. These mixers are made in three sizes, two of which are intended for mixing concrete and the other for mixing mortar. The larger one of the former type is mounted on a truck to make it easily transportable from place to place and is driven by either steam or gasoline engine, or electric motor. The smaller concrete mixer is not regularly supplied with power, and the mortar mixer is driven by a gasoline engine.

Oil Filters.—Pittsburgh Gage & Supply Company, Pittsburgh, Pa. Catalogue. Points out the advantages to be derived from the use of the White Star oil filters and continuous oiling systems, which are high efficiency of lubrication without waste of oil. In this system the oil flows from a reservoir by gravity to the different bearings, and after passing through them is collected in a separating tank and returned to the reservoir after being filtered. The illustrations show the different styles of filters and the ways of installing them in connection with continuous oiling systems, and the fittings used.

Conveying Machinery and Parts.—Link-Belt Company, Hunting Park avenue and P. & R. Railroad, Philadelphia, Pa. Catalogue No. 90. Size 6 x 9 in.; pages 400. This is the company's 1910 catalogue, describing and illustrating the standard articles it manufactures for use with conveying machinery and appliances. The majority of the illustrations are of these different parts, although there are a few general views of typical installations. *The Iron Age*, March 4, 1909, contained an illustrated description of the installation at the plant of the Champion Fibre Company, Canton, N. C., made by this company for handling sawdust, shavings, &c.

Power Transmission Machinery.—Pyott Company, Carroll avenue and Morgan street, Chicago, Ill. General catalogue No. 1. Size 6 x 9 in.; pages 72. Covers a line of power transmission machinery which includes pulleys, friction clutches, flange, jaw and ribbed couplings; pillow blocks, drop hangers, belt conveyor appliances, and shafting. These are all illustrated and briefly described and a complete price-list is included.

Electric Heating Furnace.—Baily Engineering Company, Alliance, Ohio. Pamphlet. Concerned with the resistance type of electric heater for economically heating bars and billets for forgings. The special advantages claimed for this type of furnace over those ordinarily employed are more accurate control, economy in operation, higher thermal efficiency and a lower cost per pound of metal heated. Six sizes of furnace, ranging in capacity from 60 to 1000 lb. per hour, are built, and the power consumed varies from 20 to 200 kw.

Power Hammers.—Dienelt & Eisenhardt, Inc., 1304 North Howard street, Philadelphia, Pa. Booklet. Concerned with the improved dead stroke power and bracket hammer. The ram of the former model is suspended on a flexible belt which is attached to the ends of a semicircular steel spring whose upper part is connected to the crank pin by a rod. This type of construction prevents the shaft bearings and the crank pin from being broken through the rebound of the blow. The bracket type is of the same general construction except that it is supported by a wall bracket, the stroke therefore being shorter and less powerful.

Water Meters.—Standard Water Meter Company, 243 Robinson street, Brooklyn, N. Y. Catalogue. Refers to a line of water meters in which sapphire bearings are used throughout. Four styles of meter in all are made, the disk meter, a current meter of two different kinds, and a frost proof meter. All of the meters are built in accordance with the best practice of the day and the last one is held together with cast iron clamps instead of nuts and bolts. These clamps are said to be capable of withstanding a frost pressure of 200 lb., while the body of the meter will resist any pressure up to 450 lb. In this way all injury to the working parts due to the meter becoming frozen is averted, as the clamps will break first.

Electric Fans and Portable Electric Drills.—Sprague Electric Company, 527 West Thirty-fourth street, New York City. Bulletin and circular. Bulletin No. 235 refers to the motor-driven propeller and disk fans for ventilating purposes. There is a brief description of these fans, their uses and construction, and this is followed by illustrations and tables of dimensions of direct current fans from 18 to 60 in. in diameter and alternating current models ranging from 18 to 42 in., inclusive. Circular No. 234 contains illustrations and descriptive matter about the portable electric breast drills for both alternating and direct current, which have been designed to meet the demand for a light weight tool that would be capable of giving satisfactory service under adverse operating conditions.

Ball Retainers.—The Star Ball Retainer Company, Inc., Lancaster, Pa. Circular. Covers the various sizes of radial and thrust ball retainers, for use in cup and cone and thrust bearings, respectively. These are made in a wide range of sizes, those of the first type varying from a retainer having six ⅛-in. balls to one containing ten ⅝-in. balls. The thrust ball retainers are designed for use in connection with grooved thrust washers for shaft diameters of from 9-16 to 4 7-16 in. and from 6 to 30 balls.

The population of New York City is 4,766,883, an increase of 38.7 per cent., as compared with 1900. Brooklyn, included in New York, has 1,634,351. Philadelphia has 1,549,008, a gain of 19.7 per cent. Rochester, N. Y., has 218,149; Troy, N. Y., 76,813; Rockford, Ill., 45,401; Auburn, N. Y., 34,668; Alton, Ill., 17,528.

Personal

Charles Kirchhoff, who has been abroad for several months, arrived in this country last week.

Charles F. Kenworthy, furnace engineer, until recently with the engineering department of the American Brass Company and formerly of the Kenworthy Engineering Company, has been engaged by the Rockwell Furnace Company, 26 Cortlandt street, New York, to represent it in the New England States and Canada. Mr. Kenworthy has devoted his entire time for the past 18 years to the design and construction of furnaces and fuel apparatus.

Robert A. Magly severed his connection September 1 with the Bessie Ferrosilicon Company, Columbus, whose furnace is at New Straitsville, Ohio. He had been connected with the operations of the furnace for 12 years, and for the last five was general manager of the company. He has made no definite plans for the future.

Herman E. Beyer, Pittsburgh, representative of the Southwark Foundry & Machine Company of Philadelphia, Pa., has resigned, and is now manager of the Birmingham Machine & Foundry Company, Birmingham, Ala.

August Marx, general manager of the Philadelphia Roll & Machine Company, Philadelphia, Pa., will return this week from an extended European tour.

Robert Field, widely known in the Western pig iron trade, has resigned his position with the Whitney-Kemmerer Company, Cincinnati, Ohio, on account of ill health, and for the present will not attempt any active business.

Horace V. Winchell, who has been spending some time in Sweden, attending the International Geological Congress at Stockholm and visiting Swedish iron mines, will sail from England for the United States about October 1.

The commission authorized by Congress to make an investigation of the question of control of stock and bond issues by concerns engaged in interstate commerce, as announced by President Taft, is to be composed of President Arthur Hadley of Yale, chairman; Frederic N. Judson of St. Louis, Frederick Strauss of New York, Walter L. Fisher of Chicago and Prof. B. H. Meyer, who occupies the Chair of Political Economy in the University of Wisconsin at Madison. The commission will thus be composed of two members of college faculties, two lawyers and one banker, Mr. Strauss, who is a member of the firm of J. & W. Seligman & Co.

Henry I. Lea, consulting gas engineer, Chicago, has been retained by James B. Clow & Sons, for the purpose of recommending alterations and extensions in the producer gas plant in their pipe works at Coshocton, Ohio. A producer plant of 1500-hp. capacity has been supplying all the power and light at the Coshocton plant, but the rapid growth of the business will soon require 3000 hp.

The Ehret Magnesia Mfg. Company, Land Title Building, Philadelphia, Pa., announces that January 1, 1911, it will commence shipments of Ehret's 85 per cent. magnesia products from its new reinforced concrete plant, now rapidly approaching completion on the site of its recently burnt building. It is therefore ready to enter into contract for magnesia requirements for the 12 months ending December 31, 1911.

The Owego Bridge Company, Owego, N. Y., has received contract for the construction of 13 bridges over the Erie Barge Canal on the section near Fairport, N. Y. The amount of the contract was $172,000.

Obituary

THEODORE GILES MONTAGUE, a large stockholder in the Roane Iron Company, Chattanooga, Tenn., of which his brother, D. P. Montague, is vice-president, died at Chattanooga September 2, aged 74 years. He was connected prominently with banking, manufacturing and real estate interests in Chattanooga.

THOMAS F. GRIFFIN, who was connected with Corrigan, McKinney & Co., Cleveland, Ohio, throughout his active business career, died at Colorado Springs, Colo., August 29, aged 42 years. He was at the head of the firm's iron ore department for a number of years and had to do also with its pig iron operations, coming early into a position of responsibility. For the past seven years he had been in Colorado for the benefit of his health.

LOUIS ECKEL, Syracuse, N. Y., died August 30, aged 52 years. He had been engaged in the manufacture of steel for more than 30 years, having begun as a roller in the plant of the Sanderson Brothers Steel Company. He afterward engaged with the Sweet's Steel Company in the same capacity, continuing until 11 years ago when he was one of the organizers of the Eckels-Nye Steel Company, for the manufacture of rolled steel products, which has had a successful career. He leaves a widow, one son and one daughter.

JOHN M. LARMOUR, manager of the small tool department of the Baird Machinery Company, Pittsburgh, Pa., died August 17.

JOHN KELLER HANES died in Chicago, September 2, aged 57 years. He was a native of Pennsylvania, engaged in newspaper work in Philadelphia and became connected with the business department of *The Iron Age* in 1881. In 1885 he was made manager of the Chicago office, retiring from that position in 1898 on account of his health, which he never fully regained.

Judge Smith McPherson of the United States District Court, Red Oak, Iowa, has denied the application of C. W. Post of Battle Creek, Mich., for an injunction to restrain the American Federation of Labor officials and the Buck's Stove & Range Company from entering into a closed shop agreement. The tentative agreement, the ratification of which Mr. Post opposed, the court says, was reached some six weeks ago, but the complainant remained silent until the last few days. The court says every employer of labor has the right to determine for himself whether his business shall be operated as a closed shop or an open shop, adding: "Whether it is for the better to have a closed shop or an open shop, men differ."

The twenty-eighth annual coal report of the Illinois Bureau of Labor Statistics, covering the year ending July 1, 1909, has just been issued. This report gives full statistics of the coal production of the State, based on reports from the 10 inspection districts, covering a very great amount of detail. It also includes the labor and mining laws passed at the last previous session of the Legislature. The volume comprises 487 pages. M. H. Madden, Chicago, is president of the Board of Commissioners of Labor of Illinois, and David Ross, Springfield, is secretary.

The new steel car ferryboat, the Marquette & Bessemer No. 2, that is being built for the Marquette & Bessemer Dock & Navigation Company by the American Shipbuilding Company, was launched at the Cleveland yards of the latter company September 3. The boat was christened by the daughter of John R. Scott, manager of the Cleveland sales office of the Carnegie Steel Company.

The Iron and Steel Institute's Autumn Meeting

The autumn meeting of the Iron and Steel Institute will be held at Buxton, England, September 26 to 30, 1910. The following papers will be presented:

"Electric Steel Refining," by D. F. Campbell, London.
"The Hanyang Iron and Steel Works," by G. Chamier, Hankow, China.
"Manganese in Cast Iron and the Volume Changes During Cooling," by H. I. Coe, Birmingham.
"Sulphurous Acid as a Metallographic Etching Medium," by E. Colver-Glauert, Berlin, and S. Hilpert, Charlottenburg.
"The Theory of Hardening Carbon Steels," by C. A. Edwards, Manchester.
"The Influence of Silicon on Pure Cast Iron," by A. Hague, Birmingham, and T. Turner, Birmingham.
"The Preparation of Magnetic Oxides of Iron from Aqueous Solutions," by S. Hilpert, Charlottenburg.
"The Manufacture of Rolled H-Beams," by G. E. Moore, Loughborough.
"The Utilization of Electric Power in the Iron and Steel Industry," by J. Elink Schuurman, Baden, Switzerland.
"The Briquetting of Iron Ores," by C. de Schwarz, Liége.
"Some Experiments on Fatigue of Metals," by J. H. Smith, Belfast.

The programme includes the following:

September 26.

In the evening a reception and concert will be held in the pavilion by invitation of the president of the Institute, the Duke of Devonshire, and the Reception Committee.

Special performances will be given at the Opera House each evening during the week and the Reception Committee has arranged to provide members and their ladies, on production of their badges, with eight-day tickets of admission free of charge.

September 27.

At 10 a.m., after the reception of the president, council and members of the institute, in the Old Theatre in the Pavilion Gardens, by the chairman of the Urban District Council, W. F. Mill, a selection of papers will be read and discussed.

At 12.20 p.m., a special train, provided by the Midland Railway Company, will leave Buxton for Derby, where the visitors are invited to luncheon by the Midland Railway Company. Alternative visits will then be made to the Railway Company's works and to the Royal Crown Derby Porcelain Works. The excursion is limited to 300 persons, of whom not more than 100 can visit the porcelain works.

September 28.

At 9 a.m., a general meeting for the reading and discussion of papers will be held in the Old Theatre.

At 11.30 a.m., a trip will be taken by the Midland Railway to visit the Devonshire Works of the Staveley Iron & Coal Company, by invitation of C. P. Markham, Mayor of Chesterfield and chairman of the company. The party will be entertained at luncheon at the works, and will afterward visit the Broad Oaks Iron Works of Markham & Co., Ltd., Chesterfield, where tea will be provided. This excursion is limited to 150 persons.

At 8.30 p.m., dinner at the Palace Hotel, Buxton. As the capacity of the dining hall is strictly limited to 150 places, tickets will be allotted in strict order of priority of application. For those who are unable to secure tickets for this dinner, arrangements have been made for an overflow dinner at the Empire Hotel.

September 29.

At 9 a.m., a general meeting will be held for the reading and discussion of papers in the Old Theatre.

At 11.40 a.m., a special train, provided by the London & Northwestern Railway Company, will leave for Crewe, where the party will be entertained at luncheon by the directors of the company at the Crewe Arms Hotel, after which a visit will be paid to the company's works. The number of the party is limited to 200 persons.

September 30.

The members and ladies accompanying them will leave for Chatsworth, where they will be entertained at a garden party by the president, the Duke of Devonshire.

Foundry Flask Standardization Proposed

With the sole object of assisting the foundryman, M. W. Griswold, Highwood, N. J., has submitted to *The Metal Worker* a plan for standardizing or for establishing what may be called a United States standard for foundry flasks. It is somewhat strange, says our contemporary, in view of America's unchallenged leadership in the development of interchangeable systems, that the flasks of one foundry are not interchangeable with those of another for castings of substantially the same size. It is, perhaps, not so much the size of the flasks that is the cause of trouble as it is location of the flask pins. It is, of course, recognized that a small fraction of an inch leeway makes it impossible in many cases for a cope from one foundry to fit the drag of another without running the risk of castings showing too prominently the line of parting. The following is the substance of Mr. Griswold's idea, calculated to apply to flasks of all depths:

"On account of the variation of castings for flasks, all measurements as to list sizes must be made on the inside at the parting line, and the sizes listed at the full half-inch found next below the actual measurement. (To illustrate: Should the actual width be 12⅝ in. and the length, say, 14 3-16 in., it must be listed as 12½ x 14.)

"The locations of the pin holes are not to be made from the actual measurement of the flasks, but from the list size as provided for above.

"In locating the pin holes, the measurements must be made from lines drawn at right angle through the actual center of the flask, and the distance apart along the sides of the flask from center to center of the pin holes must be exactly three-fifths of the list length (or three-tenths from the actual center line). The distance apart, across the flask, must be exactly 2¼ in. greater than the list width, or 1⅜ in. more for the distance from center line to center of pin holes. The distance 1⅜ in. is taken as being practically 35 mm.

"For flasks of less than 500 sq. in. of surface measure, the pin holes must be exactly ½ in. in diameter."

It will be noted that it is stipulated that list sizes of flasks are to be made from internal measurements. It will thus be seen that one having to make a casting of a certain size can determine at the outset what list size flask is suitable to the work. It is important to notice that the location of the flask pins will be identical with all flasks of the same list size, and, incidentally, it may be stated that Mr. Griswold finds that these dimensions show a very close agreement to most of the flasks now in use.

The International Tool Steel Company of Toronto has completed arrangements for a site at Cobourg, Ontario, Canada, on which it will erect a plant this fall for the manufacture of tool steel. The location is on the water front, and an agreement has been entered into with the Town Council giving exemption from local taxation.

The Delaware River Steel Company blew out its furnace at Chester, Pa., September 1, in order to put in a new bedplate and make other repairs to its Southwark engine, which was considerably damaged in the fire at this plant in February. Any needed repairs to the furnace will be made at the same time.

New Head of the Bureau of Mines

Dr. Joseph A. Holmes Appointed Director

The announcement was made at Washington September 2 that President Taft had appointed Dr. Joseph A. Holmes director of the new Bureau of Mines. As is well known, there has been a long controversy over this appointment, and for the past two months George Otis Smith, director of the United States Geological Survey, has been acting director of the Bureau of Mines, which was established by an act effective July 1.

Dr. Holmes has been active for a number of years in government work, particularly in connection with fuel and structural material testing and the investigation of mine explosions. He is 51 years old, and was born at Laurens, N. C. He graduated at Cornell University, class of 1881. In his college course and in the years since he has given special attention to studies in

DR. JOSEPH A. HOLMES.

chemistry (with laboratory courses in the chemistry of explosives and of metals) and to geology, mining and metallurgy. He has visited mining districts and examined iron, copper and other metal mines, coal mines and quarries and plants connected with the treatment and preparation of mineral products in many parts of the United States as well as in Germany, France, Belgium and Great Britain. The investigations in these lines have been with special reference to lessening the loss of life and the waste of resources. From 1881 to 1891 he was professor of geology in the University of North Carolina, and was geologist of that State from 1891 to 1903. In 1903 and 1904 he organized and had charge of the Department of Mines and Metallurgy of the World's Fair at St. Louis. In 1904, when Government fuel investigations were authorized by Congress, Dr. Holmes, who had planned the work, was offered its supervision, but was unable to give it the necessary time, and at his request it was given in charge of a committee consisting of E. W. Parker and M. R. Campbell, of the Geological Survey, and Dr. Holmes. This committee carried on the work through 1904, and in 1905 Dr. Holmes was appointed to take charge of the fuel investigations as enlarged, as well as of investigations of mine explosions. These two lines will constitute the main work of the new Bureau of Mines.

Dr. Holmes is a member of the American Institute of Mining Engineers and other mining societies, also of the Mining Investigation Commission of the State of Illinois, and he represents the United States on an International Mining Commission. The movement for free entry of mine safety and rescue appliances into this country resulted from his initiative, and he planned the establishment of the three State mine rescue stations in Illinois and the 12 Government rescue stations in the important coal fields of the country. On his recommendation in 1907 President Roosevelt secured the appointment by governments of Great Britain, Germany and Belgium of one prominent engineer from each of these countries to visit the United States, and in company with them Dr. Holmes visited various coal fields to determine the extent to which the modern safety practices of other mining countries might be introduced in the United States.

In the past three years, as chief of the technologic branch of the Geological Survey, Dr. Holmes has enlisted the co-operation of miners and mine owners throughout the country. Though just begun, the work of mine accident prevention is bringing results. The number of miners killed in the coal mines of this country, from being 3200 in 1907 and 2450 in 1908, is estimated at 2200 in 1909. The number of tons of coal mined for each life lost was 145,471 in 1907 and 167,545 in 1908, while the estimate for 1909 is 198,000.

Gary Statistics

In a souvenir book or pamphlet issued by the Indiana Steel Company, on the occasion of the visit of the Lake Superior Mining Institute last month, the following figures of estimated production at Gary are given:

	Tons.
Pig iron	1,200,000
Open hearth ingots	2,700,000
Standard steel rails	1,200,000
Blooms and billets	1,200,000
Merchant steel bars	600,000
Plates	240,000
Car axles	100,000
Coke	1,650,000

The eighth blast furnace was completed last spring. The rail and billet mills have been in operation a year and a half. The car axle plant was completed and started last month. The universal plate mill and the 560 coke ovens are nearing completion. Two of the merchant mills were completed last winter, and the three smaller mills included in the above estimate of capacity are nearing completion.

The blast furnaces are operated by 16 2000-hp. gas engines, supplemented by four 3000-hp. steam engines for emergencies. The power for the open hearth plant and steel mills is supplied by 17 3000-hp. gas engines which drive an equal number of electric generators, the engines using gas from the blast furnaces. Part of the excess power is transmitted 5 miles to Buffington and utilized in the plant of the Universal Portland Cement Company. The largest individual electric motors in the world are installed in the Gary mills. The rail mill has three 6000-hp. motors for driving the rolls.

In the first subdivision of the city of Gary, more than 20 miles each of sewer, gas and water pipes have been laid. The water supply is obtained through a 72-in. tunnel 15,000 ft. in length, extending into Lake Michigan beyond the reach of pollution. Individual investors have erected buildings in Gary for business purposes to the value of $1,500,000 and for residence purposes to the value of $1,000,000. The present population of the city is estimated at 20,000.

The Atlantic Deeper Waterways Convention

The Providence Meeting Large and Enthusiastic

The third annual convention of the Atlantic Deeper Waterways Association, which has for its object the purpose of furthering governmental action, to establish a chain of navigable inland waterways along the Atlantic seaboard, was held at Providence, R. I., August 31, September 1, 2 and 3. All previous records of attendance were broken. Morning, afternoon and evening business sessions were held at the Providence Opera House, the seating capacity of which was taxed to the utmost.

President J. Hampton Moore called the convention to order on Wednesday morning, when welcoming addresses were made by Mayor Henry Fletcher of Providence and Governor Aram J. Pothier of Rhode Island. These were responded to by William S. Greene of Massachusetts and John H. Small of North Carolina. A letter from President Taft and a telegram from Richmond P. Hobson, regretting their inability to attend, were read. President Moore then presented a lengthy report reviewing the work done by the association and outlining plans for the future. He referred to the survey now being made under act of Congress for a system of deeper Atlantic waterways, a report on which is expected during the next session of Congress. That at least some of the large Eastern railroad systems are not opposed to the establishment of deeper seaboard waterways was evidenced from a letter received from President McCrea of the Pennsylvania Railroad, in which the project was approved.

The report of the secretary-treasurer, Addison B. Burk, showed an increase of 318 members during the year. The increase was general, scattered along the entire Atlantic seaboard. The financial report showed receipts, $7366.21; disbursements, $7448.65; deficit, $82.44. After the appointment of various committees the opening session adjourned.

Rear Admiral C. S. Sperry presided at the afternoon session and papers were read by Commander Alfred Books Fry, chief engineer of the United States Treasury Service, on "Commercial Canals and Locks to Carry Barges of 600, 1000 and 2000 Tons Capacity." Herbert Knox Smith made an address on "Port Terminals." A paper on "Terminal Facilities Required for the Successful Co-ordination of Rail and Water Traffic" was read by Calvin Tompkins, Commissioner of the Department of Docks and Ferries, New York. L. E. Chamberlain, president of the Massachusetts State Board of Trade, Brockton, Mass., spoke on "New England's Opportunities"; and "Waterway Development in Georgia" was the topic of Joseph F. Gray, State Railway Commissioner, Savannah, Ga.

The evening session was presided over by William W. Cocks, M. C., New York, and was given over to a reception by the Providence General Committee and short addresses by members of Congress and others. The session was concluded with a lantern slide talk by Addison B. Burk, showing the various waterways along the Atlantic Coast.

Anthony Higgins of Delaware presided at the opening session on Thursday and the following addresses on waterway subjects were made: "Atlantic Seaboard Commerce, Inland and Coastwise," by O. P. Austin, Chief Bureau of Statistics, Washington D. C.; "Connecticut's Water Borne Commerce," by Governor Frank B. Weeks of Connecticut; "Relation of the Weather to Rivers," by Willis L. Moore, Chief United States Weather Bureau, Washington, D. C. An address on "Inland Waterways as an Aid to National Defense," by Richmond P. Hobson, who was absent, was presented and read at this session.

The afternoon meeting was presided over by Joseph A. Goulden of New York, and after routine business had been transacted Theodore Kolisher, United States delegate to the International Refrigeration Congress in Vienna, presented a paper on "Freight Movement by Refrigeration Barges." Roswell P. Burchard addressed the delegates on "Rhode Island, Its Commercial Relations to Other Sections, Particularly as They Would Be Affected by an Improved Inland Waterway." Governor J. Franklin Fort of New Jersey spoke on "New Jersey's Experiment in Inland Waterways," while N. B. Broward of Florida referred to "The Florida View of an Intra-Costal Waterway, Connecting with New England." Mayor John F. Fitzgerald of Boston, Mass., spoke forcibly in favor of an inland waterways system. Reports of committees followed. The Resolution Committee presented a lengthy set of resolutions, which, briefly stated, demand of the Government the construction of a deep inland waterway system along the Atlantic Coast, as a measure imperatively required to prevent the strangulation of the transporation business of the millions of people affected by seaboard commerce. In conclusion, the resolution stated that the time for action was the present for the prevention of congestion; not delay until there must be imperative relief from such a condition. The resolutions were unanimously adopted.

The unanimous re-election of President J. Hampton Moore and Secretary-Treasurer Addison B. Burk followed. The Ways and Means Committee presented plans for financing the association, and an additional membership of 500 was pledged by the delegates. It was also decided at this meeting that the next convention should be held in Richmond, Va., about the middle of October, 1911.

The closing session of the most successful, far reaching and educational convention the association has ever held was presided over by Governor Pothier of Rhode Island. Captain J. C. Cantwell of the Revenue Cutter Service and Governor F. M. Ansel of South Carolina made addresses. A brief preliminary report, from correspondence with the Engineering Department of United States America in charge of the survey now under way by the Government for an Atlantic deeper inland waterway system between Boston, Mass., and Beaufort, S. C., was presented at this session. The field work in the majority of instances has been completed, and much of the plotting has been done. Estimates for the various sections have been prepared for waterways of varying width and depth, and routes selected, except from Narragansett Bay to Boston. The principal work remaining is the collection of the necessary data to enable the board to decide upon the depth and width of the proposed canals, after which the final report can be made. This is expected to be ready for presentation during the next session of Congress. The feature of the closing session, however, was an address, illustrated with lantern slides by Commander Robert E. Peary, who made a most interesting address, describing briefly his trip to the far north and the discovery of the pole.

The entertainment provided by the Providence Committee was most lavish. On Thursday evening there was a smoker and a canoe carnival at Rhodes-on-the-Patuset. Friday afternoon the delegates enjoyed one of the famous Rhode Island clambakes. Trips by steamboat to witness yacht and motor boat races and an illumination of the harbor filled the afternoon and evening hours. On Saturday a trip to Newport was made, where the Naval Training Station was inspected, and visits were paid to points of interest in and about the city. The ladies attending the convention were specially entertained.

In the Pittsburgh district 42 blast furnaces were in operation on September 1, or two less than on August 1. No. 3 Isabella, No. 4 McKeesport and Soho were blown out in August and No. 1 Eliza was blown in.

The Republic Iron & Steel Company's Report

Earnings Last Year the Largest Except Those for the Fiscal Year 1907

The eleventh annual report of the Republic Iron & Steel Company, which covers the fiscal year ending June 30, 1910, shows net earnings of $4,227,369, which are the largest ever realized, except for the year ending June 30, 1907. The balance sheet is the first combined financial report issued by the company, the assets and liabilities of all subsidiary companies entirely owned and controlled being included in it. It is as follows:

Assets.

Capital assets:		
Cost of properties July 1, 1909		$54,558,375.36
Additions for the year ending June 30, 1910		3,654,039.32
		$58,212,414.68
Investments:		
In Potter Ore Company	$401,000.00	
In other companies	405,384.65	806,384.65
Total capital assets		$59,018,799.33
Cash deposited with trustee:		
For redemption of first mortgage 5 per cent. gold bonds in addition to $2,139,000 bonds retired in terms of the trust deed, per contra		4,444.94
Current assets:		
Inventory of manufactured products, material and supplies on hand at or below cost	$6,020,052.30	
Ore contract payments represented by ore at docks	796,844.68	
Accounts and bills receivable after deducting reserve for bad and doubtful accounts	3,789,193.59	
Cash	5,137,742.33	
Total current assets		15,743,832.90
Deferred charges to operations:		
Expenditure for stripping at mines, advanced royalties, &c., chargeable to future operations		788,195.50
		$75,555,272.67
Net current assets	$12,785,590.54	

Liabilities.

Capital stock:		
Common—273,520 shares of $100 each	$27,352,000.00	
Less—In treasury	161,000.00	$27,191,000.00
Preferred 7 per cent. cumulative—250,000 shares of $100 each		25,000,000.00
Total capital stock outstanding		$52,191,000.00
First mortgage 5 per cent. gold bonds:		
Total issue	$10,000,000.00	
Deduct—Deposited with trustee and canceled	2,139,000.00	
	$7,861,000.00	
Less—Deposited with trustee of the 10-30-year 5 per cent. sinking fund bonds in exchange for bonds of that issue	6,174,000.00	1,687,000.00
10-30-year 5 per cent. sinking fund mortgage gold bonds:		
Total authorized issue	$25,000,000.00	
Authorized for immediate issue	8,164,000.00	
Less—Amount unissued	674,000.00	
Issued and outstanding		7,490,000.00
Haselton property mortgage notes:		
(To retire which a like amount of 10-30-year bonds are reserved)		1,475,000.00
Potter Ore Company Bonds:		
$659,000 outstanding first mortgage 5 per cent. bonds, guaranteed jointly with Tennessee Coal, Iron & Railroad Company, less that company's proportion		329,500.00
Bonds and notes outstanding on the Martin Coke Works property		437,478.00
Funds:		
For exhaustion of minerals	$1,158,568.46	
For depreciation and renewal of plants	1,019,121.13	
For relining furnaces	138,023.16	
For fire and accident insurance	372,783.44	
For contingencies	201,747.58	2,890,243.77
Dividend warrants:		
Payable in equal annual installments from October 1, 1910, to 1915, inclusive		1,142,148.00
Current liabilities:		
Accounts payable	$1,957,194.54	
Ore contract balances representing cash received in excess of the value of ore shipped to customers	310,336.44	
Taxes accrued	112,009.32	
Interest accrued	138,456.31	
Dividends payable:		
1¾ per cent. on preferred stock, payable July 1, 1910 $437,500.00		
Unclaimed dividends 2,745.75	440,245.75	
Total current liabilities		2,958,242.36
Surplus:		
Balance June 30, 1910, as per attached statement		4,954,660.54
		$75,555,272.67

It is explained that the large increase in net quick assets since the date of the last annual report is accounted for by the working capital additions from profits of operations and by sales of stocks and bonds. The net balance of quick assets now stands at $12,785,590.54, this amount being considerably in excess of the company's normal working capital requirements. The working capital account will be gradually reduced, however, by charges made on account of construction contracts as they mature. The finances of the company have now been placed on a broad and flexible basis as a result of refunding the first mortgage bonds, of which the outstanding balance is only $1,687,000, subject to call on October 1, 1914. Under the provision of the mortgage securing the sinking fund gold bonds, sufficient reserve is held for the retirement of all outstanding first mortgage bonds and also for the retirement at maturity of the outstanding Haselton mortgage notes, amounting to $1,475,000, so that the balance of bonds available for future corporate uses now aggregates $13,525,000, an amount believed to be amply sufficient to meet any reasonable requirement for the further development of the company's property.

Income Account for the Year

The income account and statement of surplus for the year are as below. The total of profits, $4,227,368.96, compares with $2,769,147 in the preceding fiscal year, $3,046,618 in the year ending June 30, 1908, and $5,027,742 in the year ending June 30, 1907:

Net earnings from operations, after deducting $1,274,580.31 for maintenance and repairs		$4,073,300.09
Interest and dividends received		154,068.87
Total profits for the year		$4,227,368.96
Less—Provision for depreciation and renewal of plants	$607,581.90	
Provision for exhaustion of minerals	294,265.19	901,847.09
Net profits for the year		$3,325,521.87
Deduct:		
Interest on bonds	$422,606.46	
Dividend on preferred stock	1,669,795.75	2,092,402.21
Surplus for the year		$1,233,119.66
Add—Surplus at July 1, 1909		5,920,535.15
		$7,153,654.81
Deduct:		
Warrants issued July 31, 1909, for arrears of 6¾ per cent. preferred dividend	$1,378,140.75	
Discount and expense on new issue of bonds and preferred stock	765,902.23	
Adjustment of taxes, &c., on undeveloped coal properties	54,951.29	2,198,994.27
Net surplus carried to balance sheet		$4,954,660.54
Net profit applicable to dividend		2,902,915.41

Commenting on the income showing, Chairman Topping says: "The low prices for iron and steel reached the minimum during July, 1909, but under the influence of improved demand shortly thereafter gradually appreciated during the first half of this fiscal year, and the advance culminated the early part of the calendar year 1910. Present prices for iron and steel show some recession from the high point for the year and are now much below the level of the year 1906-1907. The average shipping value of all products manufactured by this company during the current year is over $4 per ton on finished iron and steel and approximately $2.60 per ton on foundry pig iron below the average shipping prices for the fiscal year ending June 30, 1907. The net profits, however, are the largest ever realized in the history of the company, except for the year ending June 30, 1907, but had the same shipping values prevailed as for the year 1906-1907, net profits would have exceeded by far the earnings for that fiscal year. It is gratifying to state in this connection that, owing to improvements to plant and equipment and to better manufacturing practice, the estimated saving in cost of production for the period was approximately $900,000, notwithstanding higher cost for labor and supplies during the year ending June 30, 1910, as compared with the year ending June 30, 1907; more liberal expenditures for maintenance and repairs, the increase being $386,925.95, and more liberal allowance for depreciation and extinguishment, this item being increased by $175,524.94."

New Construction and Other Comparisons

The additions to property account in the year were $3,654,039.92. The total of new construction and property additions up to June 30, 1910, was $11,506,532.64 for the northern district and $3,587,925.98 for the Southern district—a grand total of $15,094,458.62.

The gross volume of business last year was $28,296,266, as compared with $19,595,944, $18,693,882 and $31,227,424 in the fiscal years ending June 30, 1909, 1908 and 1907, respectively.

The total of net working assets, $12,785,590, on June 30, 1910, compares with $7,809,901, $6,713,820 and $6,731,917, one, two and three years previous.

CONDITION OF PROPERTIES.

The following résumé is made by Chairman Topping of the present status of the company's iron ore, blast furnace, steel works and rolling mill properties:

BLAST FURNACES.

At the furnaces no improvements of consequence were authorized during the year, but all plants have been kept in good physical condition. New hot blast stoves have been installed, replacing old stoves at the Hannah Furnace at Youngstown, and a reconstruction of the filling and distributing apparatus has been made at the three Pioneer furnaces, South. Since making this change a longer life of linings, better practice and grades seem assured. There was also authorized under date of September 28, 1909, an additional blast furnace at Youngstown, which will be known as Haselton No. 4. This furnace will have an estimated capacity of 475 to 500 tons per day. The construction of this furnace is being pushed as rapidly as possible, although it has been subjected to some delay on account of the demand for the product of the three existing furnaces at Youngstown, and the necessity of keeping these furnaces in operation at the expense of the new construction. It is expected, however, that Haselton Furnace No. 4 will be put into blast during the first quarter of 1911. Comparative figures of pig iron production are as below:

	Gross tons.
Year ending June 30, 1907	614,954
Year ending June 30, 1908	494,676
Year ending June 30, 1909	678,799
Year ending June 30, 1910	793,962

There has been no change in the theoretical capacity of the blast furnaces, but when Haselton No. 4 is completed the theoretical capacity will be increased by an additional 170,000 tons per year, and will be as follows:

	Tons.
Northern district	700,000
Southern district	300,000
Haselton furnace No. 4, estimated	170,000
Total	1,170,000

STEEL WORKS.

No expenditures were made in the year at the Bessemer steel works for the purpose of increasing the output, but owing to full demand for the product, good operations and previous improvements, the plant has produced steel considerably in excess of any preceding year's record. The only large expenditure authorized at the Bessemer steel plant was made for additional electric power, consisting of two low pressure steam turbo-generator sets of 600 kw. capacity each, designed to use the exhaust steam from the blooming mill engine at the Bessemer steel works. These machines are now in operation.

Production at Bessemer Steel Works.—Gross Tons.

Year ending.	Ingots.	Billets, slabs and sheet bars.
June 30, 1907	546,645	488,251
June 30, 1908	341,985	303,328
June 30, 1909	483,430	427,531
June 30, 1910	681,884	606,531

OPEN HEARTH STEEL WORKS.

Under date of September 28, 1909, the Executive Committee authorized the construction of an open hearth steel plant on company's property at Youngstown on the south side of the Mahoning River, opposite Haselton furnaces. Construction is being actively prosecuted on this plant, and it is expected that it will be put into operation during the first quarter of 1911. This plant will consist of a mixer, eight 60-ton open hearth furnaces, a blooming and slabbing mill and a combination continuous sheet bar and billet mill. The plant will produce open hearth large billets and slabs, small billets down to 1¾ in. square, and sheet and tin bars, which product will be consumed largely by the existing finishing mills. The estimated production of the above plant is 30,000 tons of ingots per month.

In connection with this plant there is being built a hot metal bridge and track from the hot metal railroad to the open hearth plant. By this means the Bessemer and Brown-Bonnell works, Haselton furnaces and the new open hearth plant will be connected, and interplant movements of raw and semifinished material will be handled over the company's tracks. A large proportion of the power used at the open hearth plant will be generated from blast furnace gas at Haselton blast furnaces, and a power plant for this purpose is being put in at the latter point.

ROLLING MILLS AND FACTORIES.

Early in August, 1909, the 20-in. semicontinuous skelp mill mentioned in the last report was put in operation, and in February, 1910, the 10-in. continuous skelp mill was put in operation. Both of these mills have been operating in a satisfactory manner since that time. The butt weld and lap weld mills of the tube works are substantially completed and the last department put into operation. While not as yet fully up to capacity, the plant has been operated long enough to ascertain that the estimate of 100,000 tons per year is conservative.

The reconstruction of the 60-in. sheared plate mill, referred to in the last report, has been deferred until the new open hearth plant is ready to operate, as the present steel producing capacity is all required to supply existing finishing mills with the necessary raw material. Owing to the restricted demand for bar iron it was decided to dismantle or permanently close down the following bar iron mills: Corns Works, Toledo Works, Birmingham and Gate City Works. Iron bar production hereafter will be confined to the Tudor, Inland and Mahoning Valley works. There will be no loss, however, in merchant bar production, as the increased steel bar output will more than offset the loss in bar iron capacity.

No other important changes have been made to the rolling mills and factories, except there has been a general replacement of hand machinery by automatic machinery for bolt and nut production, and general replacement improvements where better efficiency could be attained. During the current year, however, additional improvements will be made to the Brown-Bonnell finishing mill capacity by replacing four of the iron rolling mills at this plant with modern mills for the production of finished steel bars.

Annual Production of Finished and Semi-Finished Products.

	Gross tons.
Year ending June 30, 1907	804,360
Year ending June 30, 1908	434,230
Year ending June 30, 1909	565,151
Year ending June 30, 1910	827,515

IRON ORE MINES.

Exploration and development of the ore properties of the company, both North and South, has been continued vigorously during the year. A further increase in the company's ore reserves has resulted from this work. All of the ore mines of the company have been and are being maintained in the best possible physical condition. At the Northern ore mines negotiations have been successfully completed for the extension of the Cambria and Lillie leases until 1925,

and a lease of the Hartford property, adjoining the Cambria and Lillie mines, has been secured for the same period. It is believed that the extension of the Cambria and Lillie leases, together with the acquisition of the Hartford lease, will result in a considerable increase in the company's ore reserve and a decrease in the cost of mining the Cambria ore, and offset to a large extent the increased royalties on the extended leases. At the Schley, Bray and Monica properties construction work is practically completed, and these mines are now actively producing ore. At the Onondaga, Mariska and Lillie mines, new shafts have been sunk to reach bodies of ore not otherwise available. At the Kinney, Pettit, Schley, Monica and Mariska mines additional tenement houses have been built during the year. At the Union mine, 50 per cent. of which is owned by this company, stripping operations are actively under way, and when completed will result in increased output and reduced cost.

At the Southern ore mines the same policy of development and improvement has been pursued. At Raimund No. 1 slope new hoist engine and air compressors have been erected. At Raimund No. 3 slope the tipple has been generally overhauled and remodeled. At the Houston brown ore mine a new stripping outfit has been installed, consisting of a steam shovel, locomotive and dump cars. At the Alfretta group of mines operations have been indefinitely suspended. Exploration work developed that these mines were not being operated to the best advantage, as at present arranged and with increased productive capacity at other mines, the Alfretta mine production is not required.

As of June 30, 1910, there was a stock pile at the Pioneer furnaces, South, of 43,904 tons of red ore and 14,324 tons of brown ore, as a reserve supply to insure the regular operations of these furnaces. The capacity of the Southern mines is now sufficient for a three-furnace operation.

The operating efficiency of the ore mines is evidenced by the very large increase in the amount of ore produced, as shown by the following table of production during the past four years:

Year ending.	Gross tons.
June 30, 1907	947,069
June 30, 1908	1,025,460
June 30, 1909	1,451,434
June 30, 1910	2,050,224

Labor and Employment

Further wage advances were made in the past year. The average number of men employed and the amount of wages paid in four years are stated as follows:

Average Number of Men Employed.

	Year ending June 30, 1907.	Year ending June 30, 1908.	Year ending June 30, 1909.	Year ending June 30, 1910.
North:				
Ore mines	803	773	879	1,362
Coal mines and ovens	543	433	492	609
Furnaces	1,219	550	601	904
Works	8,054	4,139	4,199	6,803
Total North	10,679	5,895	6,171	9,678
South:				
Ore mines	674	499	575	690
Coal mines and ovens	1,160	941	1,056	1,122
Furnaces	550	460	503	538
Works	191	720	5	10
Commissaries	41	32	30	28
Total South	3,216	2,652	2,169	2,388
Grand total	13,895	8,547	8,340	12,066

Total Expended for Labor.

Year ending June 30, 1907	$8,686,604.58
Year ending June 30, 1908	5,832,631.62
Year ending June 30, 1909	5,700,805.03
Year ending June 30, 1910	8,652,102.13

Unfilled Orders

The following statement of unfilled orders on hand is given, and the belief is expressed that the producing capacity of the company will be well employed in the coming year:

	Finished and Semi-finished. Net tons.	Pig Iron. Gross tons.
June 30, 1907	448,627	74,500
June 30, 1908	283,743	59,196
June 30, 1909	392,420	94,247
June 30, 1910	341,887	82,906

In the above totals of finished and semifinished products nothing is included but fixed contracts, sliding scale contracts with periodical adjustments being excluded.

Ore and Coal Reserves and Coal and Coke Production

The iron ore reserves at Northern properties on June 30, 1910, are estimated at 38,909,693 tons and at Southern properties at 88,451,383 tons, making a total of 127,361,076 tons, an increase of nearly 7,000,000 tons over the estimate of three years preceding.

Referring to coal and coke properties, it is stated that the plant and property of the Woodside Coke Company will be hereafter known as the Martin Works, and 50 coke ovens are now being built at this plant. A general exploration of the Southern coal properties by drill tests is in progress. The coking coal reserves in the Northern district are now estimated at 24,190,440 tons and in the Southern district at 65,048,276 tons—a total of 89,238,716 tons. Steam coal reserves in the Northern district are put at 16,818,210 tons and in the Southern district at 57,974,480 tons—a total of 74,792,690 tons. The coal reserves were overestimated in previous reports; present estimates are based on actual drill records.

The coke production in the last fiscal year was 670,018 tons, as against 592,664 tons in the preceding year. The present coking capacity in the Northern district is 440,400 tons a year for 734 ovens, and in the Southern district 606,000 tons for 1010 ovens.

The limestone production last year was 115,473 tons, compared with 134,001 tons in the preceding year. The limestone reserves are put at 31,287,500 tons, and are practically unchanged.

Express Charges in Illinois.—The Illinois State Board of Railroad and Warehouse Commissioners has issued a maximum tariff of express charges, similar to the maximum freight tariffs which have been enforced by State law for nearly 30 years. Until recently the Illinois commission has made no effort to establish its jurisdiction over the charges of express companies, and it is expected that these companies will carry the matter into court. The new maximum tariff, like the commission's distance tariff of freight charges, is graduated according to distance and the weight of the matter carried. In some cases the express companies would have to reduce their existing charges at least 40 per cent. to comply with the proposed legal rates.

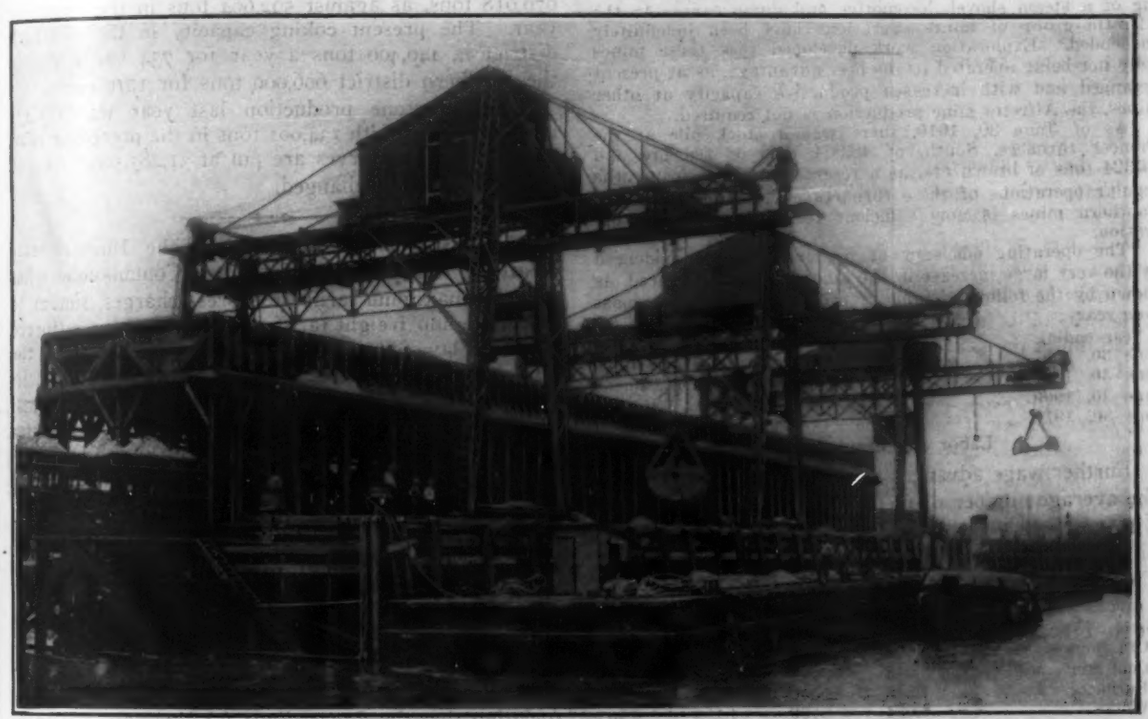
The American Foundrymen's Association.—The secretary, Dr. Richard Moldenke, Watchung, N. J., advises the members of the American Foundrymen's Association that the *Proceedings* for this year will probably make a volume of some 600 pages. Referring to the increase in dues from $5 to $10 a year, decided upon at the Detroit convention, the secretary says that the response of the membership has been gratifying, but three resignations having been received for which the increase is given as a reason. In a number of letters the statement is made that membership in the association has proved one of the best of investments.

The Ajax Auto-Traction Company has been incorporated at Portland, Ore., with $500,000 capital stock, of which $100,000 is preferred, to manufacture four-cylinder gasoline traction engines, auto-trucks and marine engines. A plant is under construction on a tract of 9 acres in Kenton, a suburb of Portland. The first building, now under construction, is 80 x 190 ft. Other buildings to be erected will be parallel to it, all communicating at the end with a general erecting shop which is planned to be 80 x 400 ft. Machine tools have been purchased, amounting to about $25,000. The plant is expected to be in operation in November.

The Metal Trades Superintendents' and Foremen's Club of Cleveland, Ohio, is planning an extensive series of lectures by shop men, starting in October and continuing through the winter, one lecture to be given at each of the monthly meetings. Such subjects as technical education, employers' liability and prevention of accidents will be discussed. The club is also arranging for a clam bake to be held late in September.

Cleveland Sand Unloaders at Panama

In the building of the locks of the Panama Canal and in the related concrete construction enormous quantities of cement, sand and crushed stone are being used and the handling of the sand is an important item in the work involved. The sand is being brought from the two coasts, but the partial failure of the sand-handling plant at the Atlantic side has thrown the bulk of the work on the other plant and most of the sand is now being brought from a bar on the Pacific Coast about 25 miles west of the City of Panama. It is found there in an enormous body, free from loam and vegetable matter, and is very white and sharp. A steam operated ladle or bucket dredge loads the sand into steel barges of 500 cu. yd. capacity. After the sand is raised by the dredge it is delivered through chutes to the barges, enough water being added to cause the sand to flow, and this process continues until the barge is full of sand, the water flowing off over the top of the barge as the sand takes its place. There is a very considerable waste of sand leaking away with the water at this time and later when the sand is conveyed to the storage bins and loaded into the railroad cars. The tracks are now white with sand from the loading point to the discharging stations. It is hoped that this loss may be decreased and the total load necessary to handle reduced by arrangements now being perfected for pumping the water out of the barges.



The Sand Handling Plant at the Pacific End of the Panama Canal, Installed by the Cleveland Crane & Engineering Company, Wickliffe, Ohio.

The sand handling plant of the Pacific division, herewith illustrated, includes three sand unloaders specially designed and installed by the Cleveland Crane & Engineering Company, Wickliffe, Ohio, having a combined capacity of 5000 cu. yd. of sand in 8 hours. This is much in excess of what is at present being used, so that the storage piles are accumulating rapidly. The cranes have a span of 55 ft. from center to center of the rails on which they run, and the trusses are high enough to clear by 4 ft. elevated double storage bins under which cars are hauled by locomotives to be loaded. The barges are brought alongside of the dock by tugs and anchored to the piling while their cargoes are transferred to the bins. The cranes have a cantilever extension of 33 ft. beyond the center line of the rail nearest the water, enabling the bucket of the unloader to reach the most remote parts of the barges. The grab bucket used is a four-line clam-shell type and weighs 1000 lb. empty. Its normal capacity is 3½ cu. yd.

All the movements in one machine are controlled by a single operator stationed in a cage on the shear leg toward the water. Here he is able to watch the bucket throughout its movement from the barge to the bins. All of the bucket movements, hoisting and lowering, opening and closing and traveling are independent, as well as the traveling movement of the bridge. When the bucket has reached its highest position it is sustained by an automatic mechanical brake until the bucket has reached the top of the bridge, when a reversal of the hoist motor automatically releases a clutch and allows the load to be taken on the back wheels, which are automatically controlled. These sand unloaders are declared to be the most rapid handling plants on the Isthmus.

The Wells Brothers Company's New York Store

The Wells Brothers Company, Greenfield, Mass., has opened a new store in New York City at 90 Centre street, under its own corporate name. The stock of tools which was formerly carried at 126 Chambers street has been moved to the new store and there installed, with so many additions to it that the entire line of Little Giant tools is now represented on the shelves.

The new store has broad show windows on each side of the Centre street entrance and another large window on Leonard street; these display the handsomely finished tools to the best advantage. Within the store is finished throughout in mission style, the wood and iron work being in perfect harmony.

A full and complete stock of screw cutting tools will be carried in this store. It is the intention of the company to keep everything in the line of tools for cutting threads ready for immediate delivery and preparations have been made to take care of any requisitions that the trade may make, whether for stock or special rush orders. The new store will be managed for the company by Charles H. Coe, formerly with A. Z. Boyd of New York City.

A Large Vertical Nash Gas Engine

An Addition to the Line Built by the National Meter Company

The four-cylinder vertical Nash gas engine recently completed by the National Meter Company, Brooklyn, N. Y., for the Phœnix Tube Company of the same city, is interesting not only for being the largest which its builder has ever turned out, but one of the largest of vertical pattern ever built, and it also has special features applied for the first time. It is the largest engine that has ever been attempted without water cooled heads, being jacketed at that point only around the valves, and it has a forced system of lubricating the main bearings in which the oil is introduced under the shaft making positively certain its presence at the place where it is most needed. The engine also has a dual system of ignition with two spark plugs in each cylinder excited by independent sources of current, both electro-magnetic. One alone is sufficient under ordinary circumstances, but all chance of misfire is practically eliminated with both in use even when operating with very lean gas. Another improvement is a simpler and more reliable form of timer.

Fig. 1 herewith is a view of the engine on the testing bench in the builder's works, taken under rather adverse conditions, but it serves to give some idea of

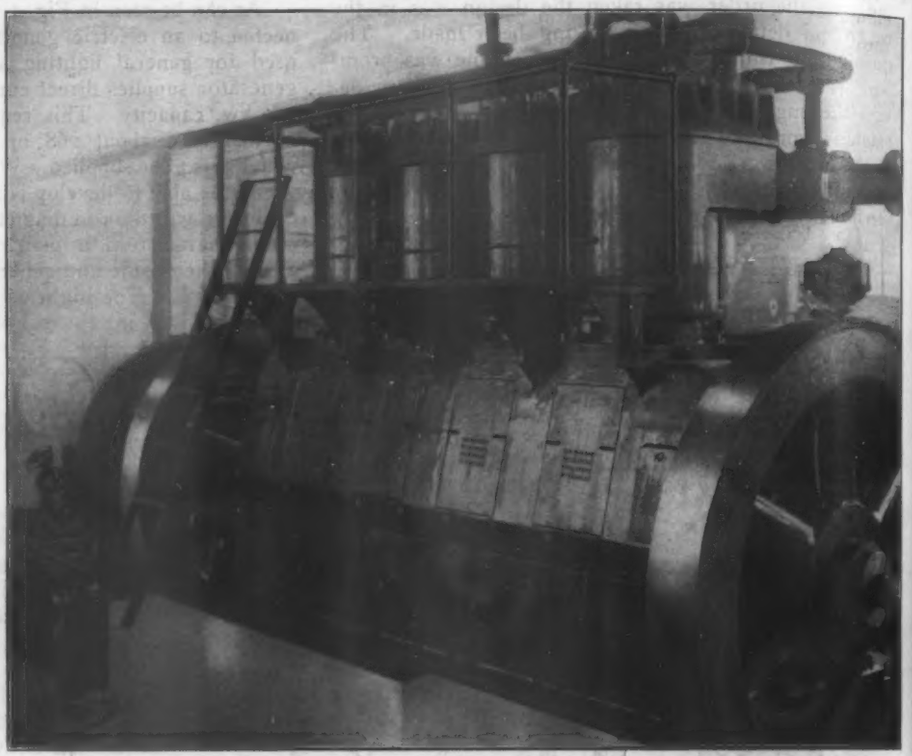


Fig. 1.—An 18 x 18 In. Four-Cylinder Nash Gas Engine on the Testing Floor at the National Meter Company's Works, Brooklyn, N. Y.

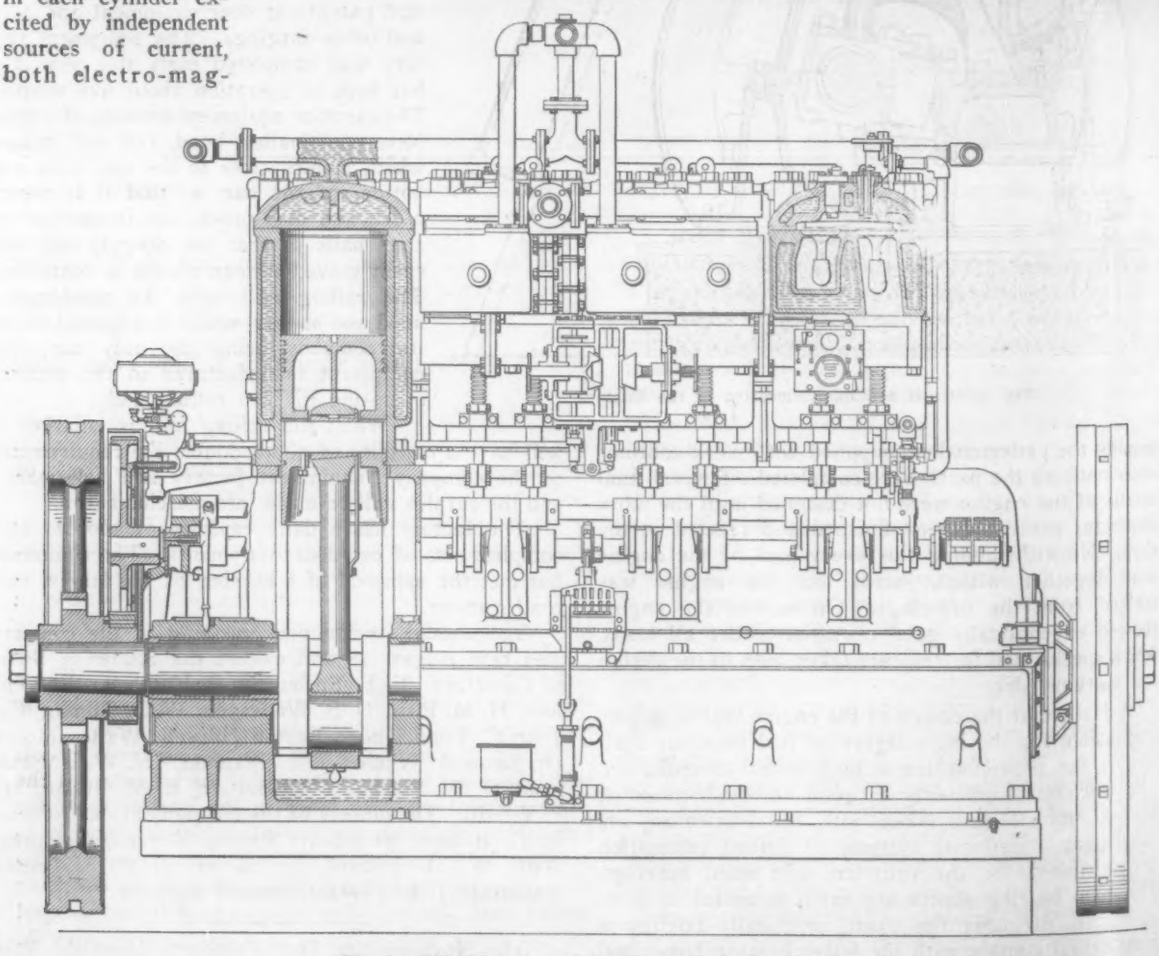


Fig. 2.—Side Elevation of the Large Nash Gas Engine.

the general appearance of the engine, and the details of construction are so well brought out in the side and cross sectional elevations given in Figs. 2 and 3 as to hardly call for further description.

Some facts concerning the building of the engine are worthy of mention. The order for it was taken on a guarantee as to its power and economy, and at the time the order was taken the design was in the rough, no detail drawings having been made. The time within which shipment of the engine was promised was very short, allowing very little time to design the engine, make the patterns and complete the machine work and erecting. Immediately upon receipt of the order work was started in the pattern shop from preliminary drawings, which were followed up later by the finished drawings, and the work was followed along keeping the patternmakers supplied with work continuously until all the parts were completed. Several final details of the engine were not designed until the more important parts had been finished and erected in the shop. Notwithstanding this every part of the engine went together without error and the engine was erected from the drawings. On testing the engine showed exceptionally good operation under all loads, which speaks well for the care taken both in the design and workmanship.

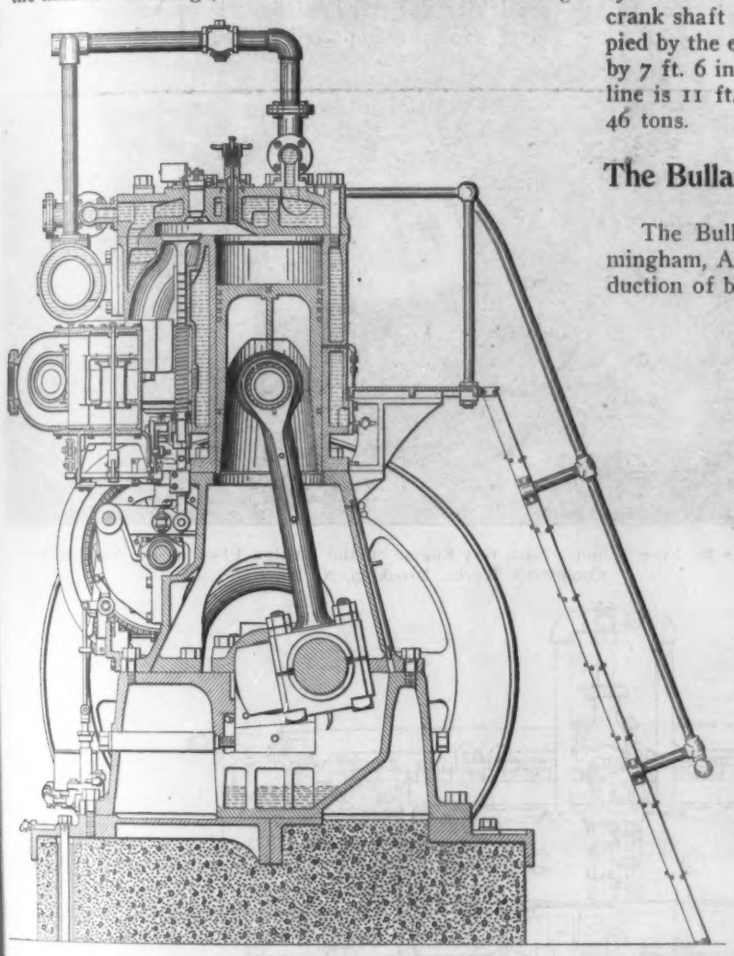


Fig. 3.—Cross Sectional Elevation of the Engine.

A feature of the design of the engine that is largely responsible for the high degree of fuel economy realized is the provision for a high initial compression. The mechanical efficiency is good chiefly because of the exceptional care taken with the lubricating arrangements. Separate systems of forced lubrication are furnished for the cylinders and main bearings. The main bearing pumps are extra powerful so as to force the oil under the shaft, practically holding it from actual contact with the lower bearing boxes and thus insuring adequate lubrication at this most vital point. In the test of the engine this system operated with entire satisfaction and has given no trouble whatever. The arrangements for admitting the charge to the engine and mixing it provide for obtaining an exceptionally good mixture, and the distributing passages are so proportioned that each cylinder does its full share of work. The regulation of the engine is also extremely good.

As can be seen in Fig. 1, the engine is directly connected to an electric generator; it is intended to be used for general lighting and power purposes. The generator supplies direct current at 125 volts and is of 200 kw. capacity. This requires of the engine under normal load about 268 hp. with producer gas with which it is to be supplied. With a richer gas the engine should be able to develop between 300 and 400 hp. Its cylinders are 18 in. in diameter by 18 in. stroke, and the crank shaft is 9 in. in diameter. The floor space occupied by the engine and generator together is 23 ft. 4 in. by 7 ft. 6 in. The hight of the engine above the floor line is 11 ft. 3 in. and the weight of the engine alone 46 tons.

The Bullard Car Door Equipment Company

The Bullard Car Door Equipment Company, Birmingham, Ala., has installed a rolling mill for the production of bars and special shapes for its own use. It is a Belgian mill, having one 12 and one 8 in. train of rolls, and has been in operation about a month. It has a daily capacity at present of 22½ tons. It is expected, however, that the recommendation of President R. G. Bullard will be adopted by the Executive Board of the company and that equipment will be added to increase the daily production to at least 40 tons.

This company manufactures the Bullard patent car door equipment and bolts and other forgings. The equipment factory was completed early this year and has been in operation about five months. The car door equipment consists of a complete combination hood, rail and hanger which clamps close to the top, sides and bottom of the car, so that it is water, spark and dust proof, and it operates on steel balls so that the door is not only easily moved but can always be controlled. The rolling mill rolls the combination hood and hanger, which is a special shape, the company being the only car door equipment manufacturer in the country operating its own rolling mill.

When the rolling mill is enlarged it will have a capacity of about double the requirements of the company's equipment factory and bolt works, and the surplus will be made into merchant iron.

The factory has a daily capacity of 1000 to 1500 complete sets of car door equipments. The equipment has met the approval of a number of the largest railroad systems.

The annual stockholders' meeting of the company was held August 18 and elected the following Board of Directors: E. F. Enslen, G. R. Harsh, O. E. Kenimer, H. M. Pitts, D. S. Wallraven, W. L. Tumlin, Col. John C. Pugh, Judge Peyton Norvell, Walter Moore, Dr. Louis A. Whaley, J. S. Shannon, Col. W. B. Bankhead, O. W. Shelby, R. G. Bullard, B. M. Bullard and J. Y. Hill. The officers of the company are as follows: R. G. Bullard, president; Peyton Norvell, vice-president; W. M. Bullard, Jr., secretary; E. F. Enslen, treasurer; J. R. Peebles, general manager.

The Northwestern Iron Company, Mayville, Wis., now has both its blast furnaces in operation, Furnace A having been blown in August 18.

The Iron and Steel Industry of Mexico

With Iron Ore Abundant, Labor Low Priced and a Market for Much More Than the Domestic Production, a Gradual Expansion Is to Be Expected—Contrasts Between Modern and Early Plants

BY JOHN BIRKINBINE

This month the Republic of Mexico celebrates its first century of independence, also the eightieth birthday of President Porfirio Diaz and the completion of 30 years of his services as chief magistrate of the nation. Our neighbor on the south will therefore be in the limelight for the remainder of the year. As a fitting means of emphasizing this centennial, the President has recommended the inauguration of public improvements by national, state and municipal governments, and efforts are being made to bring to public notice the progress which has been made. Official data are being compiled to show the development of Mexico in various lines of industry, transportation, education, finance and public improvements, and the following sketch is offered as supplementing the brief review, "The Iron Industry of Mexico," which appeared in *The Iron Age* of January 6, 1910.

The intermixture of the ancient and the modern, the crude and the refined, the wasteful and economic methods which add so much of interest to Mexico is as evident in its iron and steel industry as in other specialties, for there one finds in operation the Catalan forge, evidently imported without modification from the original habitat in Spain, cold blast and warm blast charcoal furnaces, some with but most of them without late improvements, and a modern coke blast furnace. The last mentioned is associated with an open hearth steel plant and modern rolling mill, while some of the charcoal blast furnaces puddle their pig iron with wood and roll it into merchant shapes. At some of these smaller plants the castings are made directly from the furnace and in others a part of the pig iron is re-melted in the cupola. At other plants gas producers are connected to open hearth steel furnaces or heating

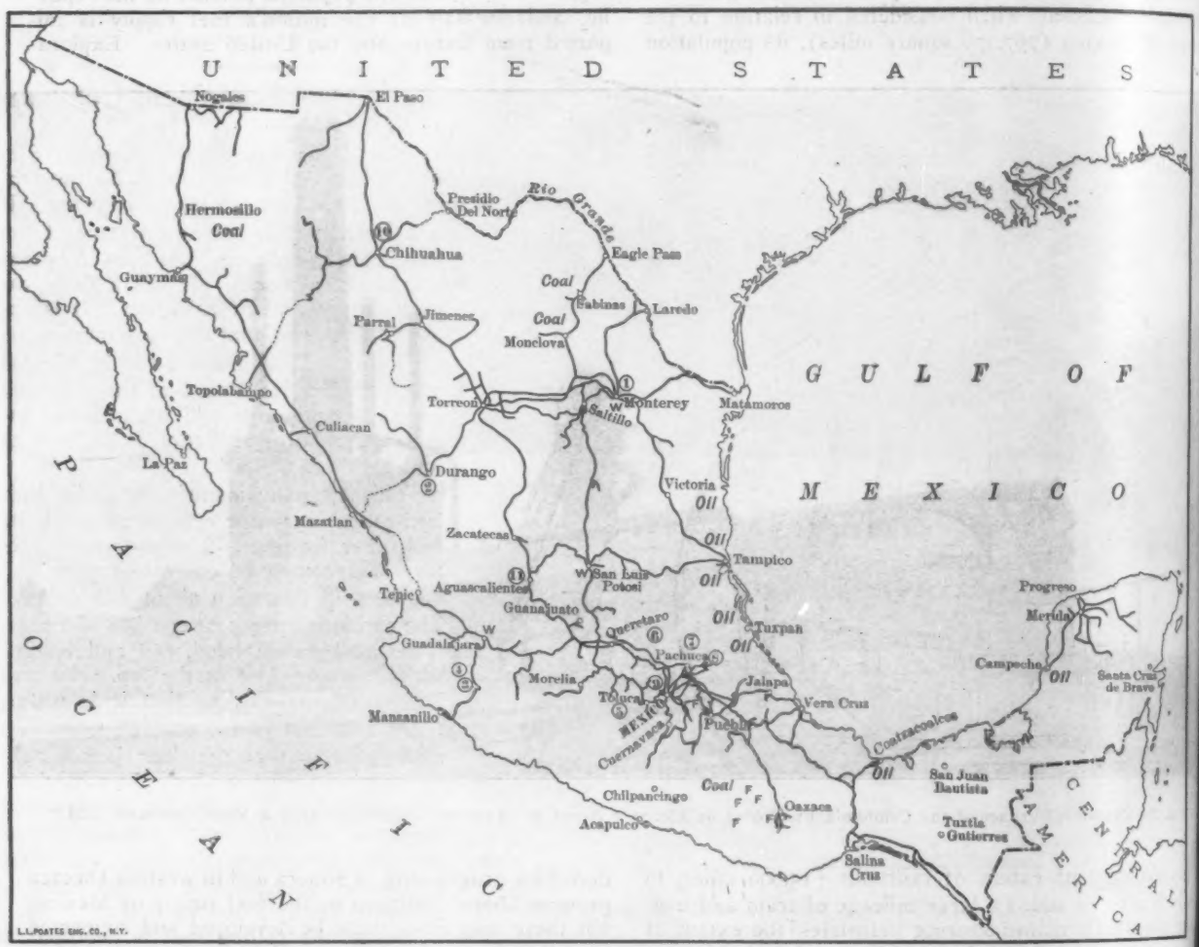


Fig. 1.—Map of Mexico, Showing the Location of Existing Iron and Steel Works, Approximate Coal and Oil Producing Territory and Present Railroad Connections.

1. Blast furnace and steel plant of Compania Fundidora de Fierro y Acero de Monterey, S. A. (Monterey Iron & Steel Company, Ltd.)
2. Compania Nacionale Mexicana de Hierro y Acero (Mexican National Iron & Steel Company) (Durango Iron Works).
3. Ferreria de Providencia (Marta Cristos Iron Works).
4. Ferreria de Tula (Tula Iron Works).
5. Ferreria del Salto.
6. Encarnacion Iron Works.
7. San Miguel Iron Works.
8. Apulco Furnace.
9. Delicias and Elcoro rolling mills.
10. Open hearth steel plant at Chihuahua.
11. Rolling mill at Aguascalientes.

W. Wire drawing plants (at San Luis Potosi, Monterey and Guadalajara).

F. Ferrerias (Catalan forges).

furnaces into which scrap iron is fed. The products of these various plants are fabricated under helve hammers, puddled with wood, heated with wood, coal, oil or gas, or converted into steel in open hearth furnaces, they are passed through rolls ranging from crude design of light pattern to a modern heavy rail train with feed tables, &c., and plans are now being prepared for an electric remelting plant. The output includes merchant bars, castings, standard rail and structural shapes, bolts, nuts, plows, horseshoes, while a considerable quantity of foreign-made material, such as wire rods, also receives finishing in Mexico. The accompanying map, Fig. 1, shows the location of the iron and steel works and of oil and coal fields.

Notwithstanding this range in character of plant and of output, the industry of our neighbor republic is far from meeting its demand for iron and steel products, a condition which may be traced to various causes. The domestic manufacture of this useful metal is remarkably deficient when considered in relation to the area of Mexico (767,276 square miles), its population (15,000,000), its extent of railroads (15,000 miles, to which must be added a large mileage of tram and trolley roads), its manufacturing industries, the extent of its cultivated land and the abundance of desirable iron ores.

A discussion of some of these controlling features may properly precede any detailed reference to the present iron industry of the republic.

The Iron Ore Supply

Mexico has an abundance of iron ores, some deposits being fairly entitled to the use of the word "enormous" as descriptive, and many of the ores are exceptionally rich in iron contents, some being well within the Bessemer limits of phosphorus. There are also many ores which contain iron in moderate amounts, but the number of important deposits which can supply iron ores carrying 60 per cent. of iron or more are sufficient to invite their utilization upon a liberal scale.

Most of these iron ore deposits can be best utilized for domestic iron manufacture, as, to convey the mineral to ports for shipment by vessel, or across the boundary into the United States to localities where fuel could be obtained, would demand long railroad hauls. Some of them, however, are within convenient reach of water transportation, especially on the Pacific Coast.

However, the number and extent of the iron ore deposits of the republic give promise of adding materially to its wealth, as improved processes are perfected, and the opening of known coal bearing areas will also facilitate the utilization of this important resource.

Fuel

Mexico is a country in most of which fuel is scarce and expensive, a condition which has retarded the establishment and operation of iron and steel works. For centuries wood and charcoal were the only fuels available, and continuous drafts upon the forests have depleted these, except in the distant mountains, most of which railroads have not yet reached. The coal obtained from northern Mexico, some of which is coking, is distant from the populous portion of the republic, and one-half of the nation's fuel supply is imported from Europe and the United States. Explorations now progressing in Sonora and in western Oaxaca promise liberal additions to the fuel supply of Mexico, but these coal fields must be developed and connected by railroads to make them available.

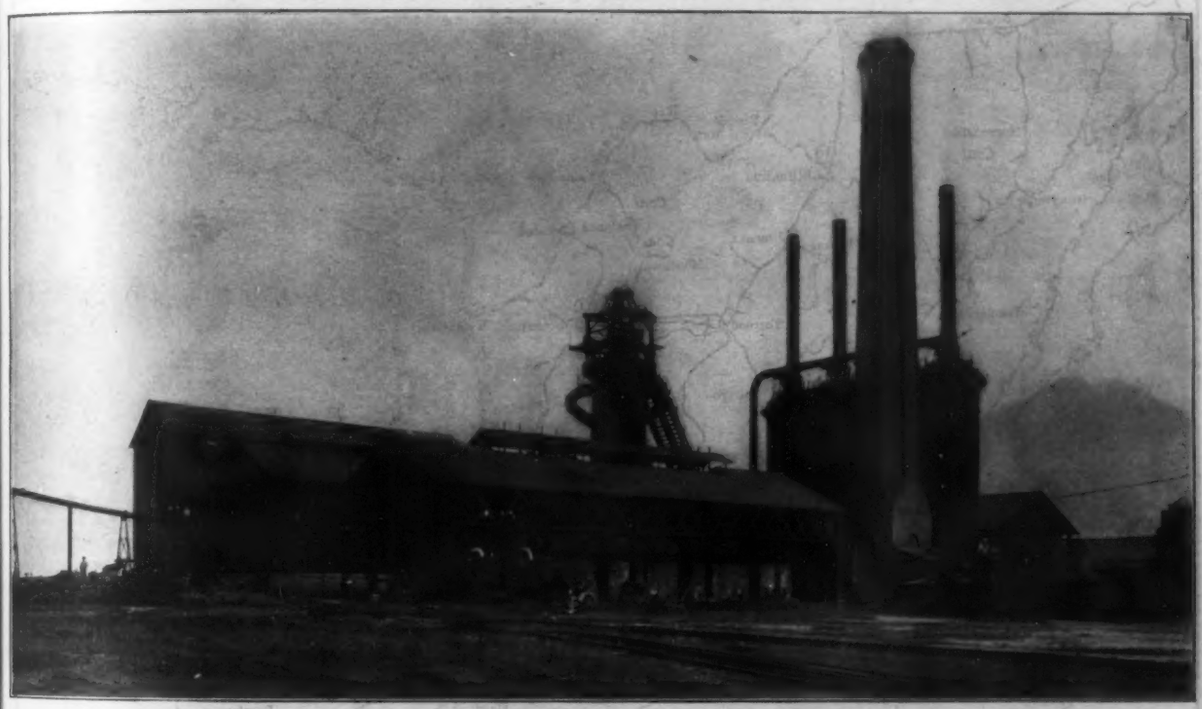


Fig. 2—The Blast Furnace of the Compania Fundidora de Fierro y Acero de Monterey (Monterey Iron & Steel Company, Ltd.).

The productive coal fields in Coahuila are located near the Rio Grande, where a gas coal is obtained, and from 100 to 150 miles south of the national boundary, where the Monclova or Sabinas fields are thoroughly exploited in the vicinity of Lampacitas, Esperanza and Baroteran, where slopes extending 1300 ft. and a vertical shaft 950 ft. deep are features of development. This Coahuila coal is geologically in the cretaceous horizon, and carries ash and sulphur in such proportions as to require disintegration and washing, 2 tons of coal as mined being necessary to produce a ton of satisfactory metallurgical coke, for which a liberal market exists at the steel plant at Monterey and at large silver smelting furnaces in northern Mexico. This district supplies over 1,000,000 tons of coal annually.

Low ocean freights for coal in cargoes, brought from Europe or from the United States to Gulf ports, permit foreign fuel to enter the republic at very satisfactory rates, but the topographical conditions demand high freight charges from the Gulf ports to a majority

of the consuming and populous centers, because these are from 5000 to 7500 ft. above sea level and from 250 to 400 miles distant. The ton-mile rate, therefore, must be liberal to give the railroad companies satisfactory earnings. The government controls most of the prominent railroad lines, and favors the coal from northern Mexico by a differential of about 50 cents per ton for the longer hauls as against shorter hauls for the foreign fuel; but, notwithstanding this, most of the coal marketed in the vicinity of Mexico City comes from foreign lands.

The explorations which for three years have been carried on by means of drifts, shafts and diamond drills, have disclosed bodies of coal in western Oaxaca sufficient to encourage a railroad concession to make these available, and surveys for this road are now in progress. As the distance which the Oaxaca coals must traverse to reach the industrial district of Mexico approximates the mileage from Gulf ports, and as these fields are located at an altitude of about 6000 ft. above sea level, the possibilities of fuel from this district becoming an important factor must receive consideration in the future. Coal is also indicated in eastern Mexico, but such developments as have been made fail to demonstrate this in quantity.

Fig. 3.—Heating Furnaces of the Compania Fundidora de Fierro y Acero de Monterey.

Business Possibilities

The topography of Mexico also favors iron and steel industries located at or near the average elevation of important cities and consuming districts, for the product of foreign iron and steel works must be carried inland over adverse grades, at freight rates which aid in protecting domestic manufactures.

The 300 years during which Spain crippled the activities of Mexico were followed by two-thirds of a century of internal troubles, and the real awakening of Mexico covers but little more than three decades. In this relatively short interval 15,000 miles of railroad, many industries and numerous public improvements have transformed the country, and it has changed from a debt-burdened nation to one whose credit is excellent. While the progress of Mexico under the rule of President Diaz is remarkable, it is not surprising that this advance has been more marked in some lines than others, and that iron and steel have not taken a leading position.

The government has been liberal in granting industrial and transportation concessions, but it demands rigid adherence to the provisions granted the concessionaires. It has established tariff rates to protect its manufactures, but has waived these in whole or in part when domestic industries did not economically produce the articles required for the development of the country, and under this policy importations of iron and steel exceed the home production.

Large volumes of foreign capital have been invested in Mexican industries and development, the proportion from the United States being greater than from any other nation. Some of the returns from investments have been so phenomenal as to invite others, upon the supposition that Mexico seeks opportunity to drop her mineral wealth into waiting laps. Other investments have been satisfactorily remunerative, and others still have resulted in failure, for the promoter's promises are not always fulfilled. In Mexico injudicious exploitations, provisions for plant in excess of requirements, and inefficient management are as fruitful sources of disaster as elsewhere.

Our neighbor republic undoubtedly has enormous mineral wealth, great industrial and agricultural possibilities, which will repay judicious investment after full investigation and efficient management, and it is to be expected that much of the financial returns will be to foreigners who are responsible for the improvements.

As a rule the Mexican is imitative rather than originative, hence a large part of the industrial progress of the republic is due to foreigners, and while there are numerous Mexicans of wealth, their investments are chiefly in haciendas and plantations, or such industries as have long been well established in Mexico. So much of the wealth of the nation has been placed in multitudinous churches of elaborate construction and ornamentation, so many drains upon the savings of its people have resulted from numerous civil wars, and so little attention has until late years been given to education, that we may be surprised at the progress which is shown, especially when we recognize the dominating skepticism by which innovations are received. But much of the apparent old-fogyism accredited to Mexico is due to local conditions of labor, fuel and climate, inability to appreciate which by foreigners has resulted in many financial failures.

In a country where labor is abundant and the wage rate far below what is paid in the United States, and where fuel is costly, labor-saving appliances are not always economical, and with few necessities to supply, the Mexican peon, who represents the majority of the

Fig. 4.—The 40-In. Blooming Mill of the Compania Fundidora de Fierro y Acero de Monterey.

population, is not a large consumer of products of mine or factory.

Throughout Mexico a great proportion of traffic is transported upon the backs of peons, burros, mules or horses, and the oxen-drawn "carreto," with its clumsy wheels formed of slabs of cottonwood, held together by wooden keys and revolving on a wooden axle, and whose body is composed of wooden sticks lashed together by cords, is evident in most of Mexico. The capabilities and endurance of Mexican Indians as burden bearers are marvelous, and their aptitude in many lines of industry make them competitors with improved methods which are looked upon as essential in the United States.

Throughout the republic, and occasionally in the capital city, one sees scaffolding formed of poles and slabs held together by ropes instead of nails, and beyond the brazeros, on which food is cooked with charcoal, anything in the line of stoves is unusual. The country has existed so long with iron as almost a precious metal, especially to the predominating peon class, whose requirements are limited by a superb climate and a low wage rate, that the per capita consumption will continue small for years, although it will advance with increased earning capacity.

The value placed on articles of metal may be noted on any market day, when, spread out on the stones of the plaza, scrap iron, spikes, nails, keys, locks, chain links, &c., are offered for sale. Some iron works are inclosed by walls, and employees leaving by the gate

Fig. 5.—Hot Saw of the Compania Fundidora de Fierro y Acero de Monterey.

Fig. 6.—Merchant Mill of the Compania Fundidora de Fierro y Acero de Monterey.

are searched, for the daily wage rate approximates the value of 25 lb. of scrap iron in the cities, and in the country a laborer who receives for each day the value of 15 lb. of this metal is fortunate.

Prevailing Prices of Iron in Mexico

The transportation problem seriously affects local prices in different portions of the country, but to indicate those now prevailing, the following quotations are for various forms of iron and steel sold in the city of Mexico, the center of industrial activity. These prices are given on a gold basis, but in Mexico they are quoted in Mexican currency and would be double the figures given. The quantity of domestic iron and steel being but a small portion of the total consumption, there is little wholesale trade, and there would be small variation between the prices quoted, whether for jobbers or for individual consumption, but it is probable that large consumers could purchase at from 10 to 15 per cent. off the prices named:

Prices in Gold, per Metric Ton, in Mexico.

United States or Scotch foundry pig, employed principally in foundries as a scrap carrier	$38.00
Domestic pig, of which little is sold	40.00
Ordinary cast scrap	9.00
Gray iron scrap	15.00 to 17.50
Ordinary wrought scrap	12.00
Old car wheels	20.00
Bar iron, ⅜ in. or smaller, round or square	77.50
Bar iron, ½ to 3 in. round, and ½ to 4 in. square	72.50
Flats, from ⅝ x ¼ in. to 8 x 1 in.	72.50
Smaller flats	90.00
Angles, ¾ to 2½ in.	75.00
Angles, 3 in.	70.00
Half round, ⅝ to ⅞ in.	90.00
Half round, ¾ to 1½ in.	80.00
Platina, the flat iron, generally ⅞ x 3 in., cut into short lengths and bent to facilitate transportation by burros	75.00

In the enumeration which follows an attempt is made to indicate all of the Mexican iron works of which record has been found, and it is believed that none of any moment are omitted. On the contrary, some are mentioned which are not at the present time active, but the omissions are mostly the ferrerias, whose locations are in the mountain fastnesses, and whose product, being small, is utilized locally. But before discussing the individual plants a statement concerning imports and duties may aid in an appreciation of the status of each industrial establishment.

Iron and Steel Imports Into Mexico

Examination of the statistics of importations demonstrates the extent to which Mexico depends upon foreign iron and steel. In the six fiscal years ending July 1, 1909, importations of iron and steel, not including machinery, aggregated 1,187,413 metric tons, valued at $59,205,382 (gold), an average of about $10,000,000 per annum. In this total the following are included:

Some Mexican Imports in Six Years Ending July 1, 1909.

	Metric tons.
Pig iron and iron turnings or fillings	22,459
Steel ingots or blooms	108
Ferromanganese	2,023
Railroad iron and steel	507,494
Structural steel	125,409
Structural iron and steel for electrical transmission service	9,925
Small shapes, such as tees, ells, &c.	28,128
Merchant bars	15,226
Wire, including fence wire and fastenings	89,103
Wire cable	4,365
Hoop iron	1,796
Corrugated iron	93,554
Tin plate	29,716
Steel springs	743
Iron chains	2,250
Water pipe	145,154
Plows and agricultural implements	18,584
Iron and steel utensils, plated or enameled	41,701
Iron cooking and heating stoves	6,329
Nails, tacks, screws, &c.	36,096

The articles specified are subject to duties ranging from $5 to $150 (gold) per metric ton, but many importations are admitted free under specific concessions, pending the development of domestic industries which can successfully produce the various manufactures.

The construction of railroads was and is still stimulated by concessions which admit free of duty most of the material required for construction and equipment, but as Mexican rails are now produced this privilege will probably be limited. However, many important improvements aiding in industrial developments are now encouraged by concessions which permit of employing foreign made machinery and equipment free of duty.

The duty on rails weighing over 10 kg. per lineal meter (20 lb. per yard) is $12.50 per ton, and lighter rails pay $30 per ton. Iron and steel beams, not cut or punched, pay $17.50 per ton, and those that have received shop work pay $25, while chains pay $55, nails, &c., $60, and stoves $40 per ton. The duty on merchant steel is from $30 to $35 per ton; on iron wire 1 mm. in diameter $27.50, and on smaller wire $45; on fence wire and fastenings $12.50; on plows and agricultural implements $8.25; on wire cables $5.50; on

iron water pipes 15 cm. (6 in.) or less in diameter $12.50; on larger pipes $5 per ton. Ferromanganese pays $7.50; pig iron $10; blooms or ingots $12.50; angles, tees, &c., $30 to $35; hoop iron $40 per ton.

The rates of duty indicate the protective policy of the Mexican Government, but had such duties not been rebated its present railroad system could not have been developed nor many of its industries established. Such concessions are still made, but as the nation becomes more self-dependent they are less readily granted.

The internal revenue is an important source of income, stamps being requisite to legalize commercial paper or official documents, and with the approval of the general government, states may make special levies. Thus it is claimed that the excellent municipal improvements of Merida were paid for by an export tax of 6 cents per hundredweight on henequen (sisal), assessed by the state of Yucutan, in addition to the federal tax of 12 cents per hundredweight.

In all taxes, concession charges, forfeitures, &c., the general government is no more exacting upon foreigners than upon natives, and while there exists a feeling of favoring "Mexico for Mexicans," this is mainly confined to enthusiasts on the one hand and to malcontents on the other. The sentiment may be an honest expression of patriotism, or it may be a convenient shibboleth for demagogues, but in any criticism of it we must remember that prior to the Centennial Exposition in 1876, which opened the eyes of the people of the United States to the true position of other nations, Great Britain, with whom we had twice been at war and had twice defeated, was popularly considered an enemy. Mexico fought with the United States and was not only vanquished but relinquished more territory than it retained. And the interval between the Mexican war and the present day is the same as elapsed between the war of 1812 with Great Britain and our centennial year.

In every country there are those who, while incapable or unwilling to make serious effort to improve conditions, criticise adversely all who attempt advances, but such criticism has little more than passing effect.

The governmental policy, while apparently friendly to foreign capital, is patriotic in efforts to stimulate domestic activity, and, in so far as its own people assume responsibilities, encourages Mexico for Mexicans.

The Monterey Steel Plant

The one modern iron and steel plant is at the city of Monterey in northeastern Mexico (168 miles south of the Rio Grande), 640 miles north of the capital, where the Compania Fundidora de Fierro y Acero de Monterey, S. A. (Monterey Iron & Steel Company, Ltd.), has a blast furnace, a steel plant and rolling mills. The blast furnace is capable of producing from 200 to 300 tons of iron per day. The three 35-ton open hearth steel furnaces are worked on the duplex system in connection with a small Bessemer converter fed with liquid metal from the blast furnace. The open hearth and heating furnaces are connected to a battery of gas producers. A well equipped mill, with soaking pits, blooming, roughing and finishing sections, is arranged to roll structural shapes, rails, &c. A merchant mill, foundry, machine shop and bolt and nut works are other features of the plant. Accompanying illustrations, Figs. 2 to 7, present views of various portions of these works.

Iron ore comes to Monterey by railroad from the steel company's and other mines to the northwest, and from the Cerro de Mercado at Durango, to the west. Fuel is supplied from the Sabinas district in the state of Coahuila, some 200 miles northwest, supplemented by imported coal and coke received at the port of Tampico and transported by rail 320 miles to Monterey.

This enterprise was a bold venture by Mexican capitalists, requiring the opening up of mines and quarries, the construction of railroad connections to assemble the raw materials and the education of labor to operate the plant, besides which it had to demonstrate to the people of Mexico its capabilities. The design of the plant and of most of the machinery is American, the management and most of the employees being Mexicans.

The blast furnace is 18 ft. bosh and 80 ft. high, equipped with four firebrick hot blast stoves, skip-hoist, &c. The blooming train is 40 in., roughing train 32 in. and finishing train 28 in. It has also an 18-in. train for light rails and structural shapes and 12 and 14 in. trains in the merchant mill.

Petroleum is the fuel used in making bolts, nuts and rivets; the oil coming from the state of Vera Cruz commands about 4 centavos a litre, or, say, 8 cents,

Fig. 7.—Machine Shop of the Compania Fundidora de Fierro y Acero de Monterey.

gold, per gallon. The bituminous coal from Coahuila carries 23 and 24 per cent. of ash, and commands about $4.50 per ton, delivered at Monterey. Coke from this coal washed contains about 15 per cent. of ash, and is worth $9.50 per ton. A premium of 10 cents per ton is allowed for each per cent. of ash below 15 per cent., and a penalty at the same rate is deducted for excess of ash from 15 per cent. up to 17 per cent. Owing to the ash and sulphur in the domestic fuel considerable coke has been imported from Europe and from the United States, Pocahontas coke being delivered at figures close to the cost of domestic fuel.

The company is constructing improved washing and coking facilities at its mines, with the expectation of such beneficiating producing desirable domestic fuel.

The Monterey plant has entered into a contract with the National Railways of Mexico (the consolidated roads now controlled by the Mexican Government) for a supply for a term of years of 85-lb. steel rails. Some of these rails are in place and in constant use between the cities of Mexico and Queretaro, which Senor Adolfo Prieto, managing director of the Compania Fundidora de Fierro y Acero de Monterey, proudly characterizes as "the first steel rails rolled in any Latin-American country."

The limit placed upon the composition of these rails as to phosphorus is 0.04 per cent. and as to sulphur 0.06 per cent. The record of tests made by the inspector in March, 1910, shows the following composition:

Analysis of Monterey Steel Rails.

Carbon.	Manganese.	Silicon.	Phosphorus.	Sulphur.
0.72	0.98	0.14	0.030	0.032
0.63	0.75	0.14	0.036	0.056
0.62	0.75	0.12	0.039	0.040
0.62	0.80	0.16	0.033	0.030
0.67	0.75	0.14	0.025	0.036
0.71	0.78	0.14	0.037	0.024
0.70	0.75	0.11	0.035	0.044

Under this Government contract the Monterey plant expects to supply 32,000 tons of 85-lb. rails in 1910, together with the 4000 tons of angle plates, track bolts and spikes. In addition some 18,000 tons of structural steel, an equal amount of merchant iron, light rails, &c., and 3000 tons of steel for reinforcing concrete work make up the contemplated output of the plant for the current year.

The record for the year 1909 was seriously affected by a flood of phenomenal proportions, which was liberally discussed in technical publications because of the abnormal amount of rain which fell in limited time. This flood curtailed the activity of the plant for nearly two months and cost the company fully $350,000. But the report of operations for the 10 months of activity show that production was as follows:

Production of the Monterey Plant in 1909 (10 months).

	Tons.
Pig metal	59,859
Structural shapes	8,190
Merchant iron	8,076
Rails	25,109
Angle plates	1,334
Steel for concrete	2,986
Castings	2,661

And there was used the following material:

Material Used at Monterey in 1909.

	Tons.
Company's iron ore	58,085
Purchased iron ore	49,319
National coke	36,816
Foreign coke	42,145
National coal	41,804
Foreign coal	42,753
Limestone	21,437
Ferromanganese	483
Ferrosilicon	116
Fluorspar	751
Company's scrap	9,949
Bought scrap	7,588
Miscellaneous	726
Total	311,972

The iron ore supply consists of magnetites and red hematites, there being a number of deposits of these minerals in northern Mexico, but some of the more accessible magnetite ores carry high percentages of iron with sulphur in such proportions as to encourage beneficiating the ore. This is now being investigated, but independently of these the furnace burden consists of ore approximating 60 per cent. of iron. With the abundance of limestone in northeastern Mexico, the Monterey plant is able to select a flux satisfactory in quality and in price.

To utilize to advantage its structural shapes, which include sizes up to 15-in. I-beams, the works has equipped a structural shop and employed engineering talent to design and undertake the contracts for construction. The steel work of some of the important buildings now being erected in the capital is supplied by the Monterey Iron & Steel Company.

Contrasts

Iron ore, flux, fuel and other supplies arriving by carloads or train loads, finished products shipped away

Fig. 8.—General View of the Now Abandoned Piedra Azul Iron Works on the Tunal River, Near Durango, Mexico. This Shows the Dam and Blast Furnace Stack in the Foreground, the Wall Around the Works, and a Chapel and Residence in the Background.

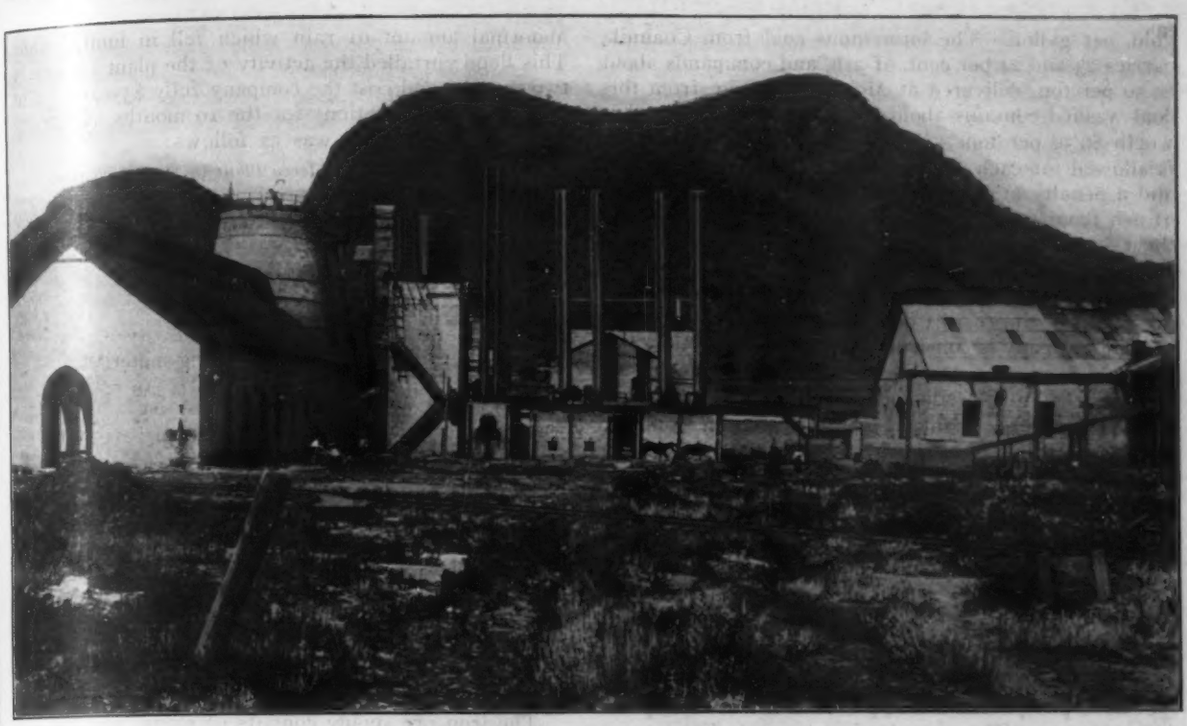


Fig. 9.—View of the Blast Furnace of the Mexican National Iron & Steel Company at the Foot of Iron Mountain (Cerro de Mercado), Just Outside of the City of Durango, Showing That the Furnace Is Close to This Enormous Supply of Mineral.

in the same manner, ponderous steam engines driving roll trains, minor motors moving tables on which ingots, blooms, rails or shapes are carried, power cranes serving soaking pits and blooming train, and all the multitudinous accompaniments of a modern iron producing and steel manufacturing plant cause the Monterey industry to stand out in strong contrast with the other active iron plants in Mexico, sketches of which follow.

Although in some particulars even the older plants have displaced ancient methods, and some later constructions have included modern features, little of the raw materials used in iron manufacture outside of Monterey are received in larger units that a man, burro or mule can carry or a small tram car convey, and most of the product is distributed in mule or ox carts or on backs of pack animals, at least until the railroad is reached.

An Old Mexican Charcoal Blast Furnace—The Durango Iron Mountain

The writer's first acquaintance with the iron industry in Mexico was in 1882, in connection with a visit made to inspect and report upon the Cerro de Mercado at Durango, one of the most remarkable deposits of iron ore known. The impression then made of the magnitude of this deposit has been verified by subsequent visits to it and to most of the important ore exposures or developments in the United States; while a study of the records of the iron ore reserves of other countries fails to demonstrate any more impressive exposure of iron ore above ground. It may be truly styled "a mountain of iron ore," a term often used but seldom verified in prospectuses describing apparently large ore deposits.

About the middle of the sixteenth century this mountain attracted wide attention, having been reported as a mass of gold and silver, and it is claimed that Mercado, after whom it is named, died in his efforts to secure possession of it. Others claimed that it was a great meteorite, basing their opinion probably upon the phenomenally large meteoric masses which have been discovered in northern Mexico, and Ward's "History of Mexico" states that the expedition sent out in 1858 to examine the mountain was the initial cause of settlement of northern Mexico. The Mexican Government has brought to the capital at considerable expense some of the great meteorites which fell in northern Mexico fully 1000 miles distant. One of these weighs 11 tons; another is in two pieces, whose combined weight is about 25 tons. With a knowledge of such terrestial visitors it is not surprising that as the story of the Cerro de Mercado traveled, accompanied evidently by samples of the richer and denser ore, its reputation as an immense meteorite gained favor.

Some of the Cerro de Mercado ore was used locally in Catalan forges prior to 1828, when the governor of the state of Durango contracted with an English company to establish an iron works on the Tunal River.

At the time of the writer's first visit, iron ore was conveyed from this deposit by the typical oxcart with its cumbersome wooden wheels, or in paniers on the backs of animals, seven miles to the Piedra Azul Iron Works, on the Tunal River, Fig. 8, and there smelted with charcoal into pig iron, which was subsequently puddled with pine wood and rolled into merchantable shapes, not kept closely to gauge, and generally sold including fag ends. As at that time the railroad awakening in Mexico was in its infancy (Durango being 600 miles from any operating line) the prices demanded for much of the product were excessive, ordinary bar shapes bringing from 8 to 9 cents per pound, while the larger flats used for tires brought, with fag ends, 12 cents per pound. These prices are all on gold basis, which is used throughout this sketch. A friend writing concerning this plant says: "Did you ever see any of the bars they rolled there on that little old train? Their half-inch rods would be round on one end and square on the other, out of the same finishing pass. Do you know of any mill in this country where they can do that?"

The Piedra Azul Works was a representative of others subsequently visited, of which there were probably 10 in the entire republic, their combined product not exceeding 40 tons per day of castings and merchant iron. Power was furnished by a dam across the river diverting water to a wheel operating two iron blowing tubs, which delivered blast into a stone furnace stack about 30 ft. high lined to a bosh diameter of 8 ft. and blown with cold blast by one open tuyere. Cinder as made was dragged by hand from the open fore-hearth,

which, when filled with molten iron, was tapped and cast into pigs or ladled out for various forms, such as plow points, kettles, &c. Most of the pig metal, however, was puddled by the use of pine wood, the puddle ball passing through a squeezer and then to rolls. Owing to conditions of labor and stream flow, the blast furnace and rolling mill alternated in activity, the former being in blast for probably five months in the year accumulating a stock of pig iron, most of which in the next five months was rolled into desired shapes, and if for an order received after the season's rolling was completed there was no stock on hand, it would not be filled for half a year or more.

It is not surprising that under such circumstances all manufactures of iron or steel commanded exorbitant prices in the city of Durango, although this mountain of iron ore, containing many million tons, was just outside of the city limits. Nails sold at 19 to 22 cents per pound, and a box ordered for the purpose of carrying samples was dovetailed, because the wage of the carpenter at 50 cents per day appeared more economical than the purchase of nails, and the screws for the lid cost 30 cents per pound.

This interesting plant of Piedra Azul suspended operations about 20 years ago, after an American company established a blast furnace and rolling mill plant at the Cerro de Mercado, but the proprietor had the satisfaction of charging his future competitor $75 per ton for pig iron to be delivered in 10 months for use in a foundry which had been unwisely erected in advance of the blast furnace construction.

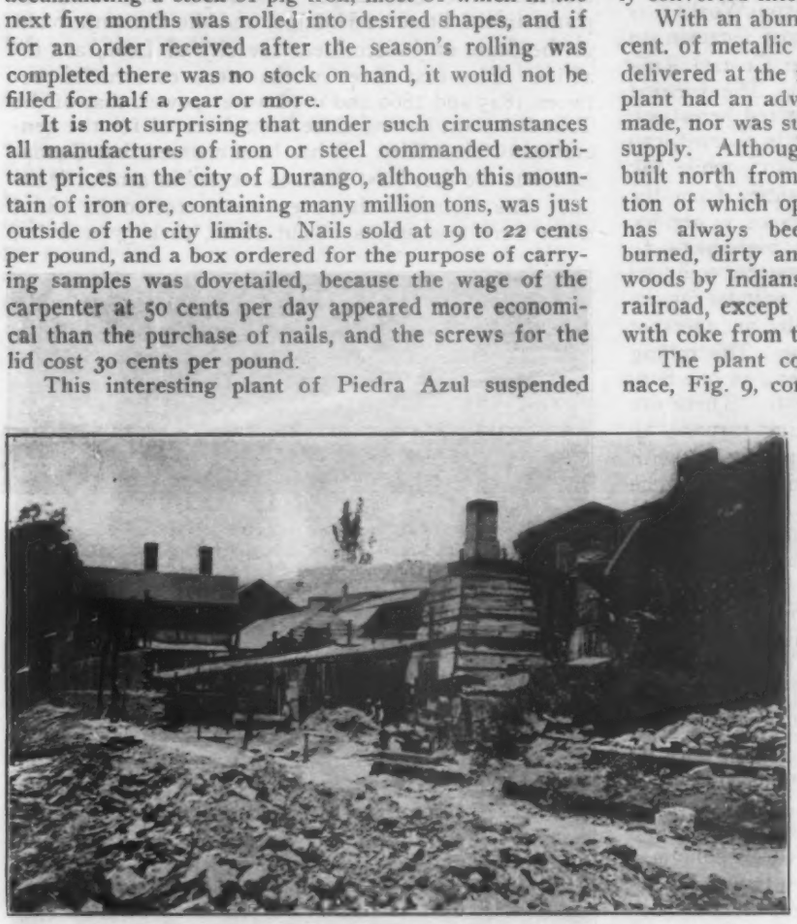


Fig. 10.—Apulco Furnace, Hidalgo, Mexico, Subsequent to the Destruction of the Cast House and Charging Floor by Fire. Ore and Charcoal Are Received on Upper Level and There Fed Into the Furnace. The Foundry Is Shown in the Background.

Subsequent to the proprietor's ceasing operation at Piedra Azul some Americans attempted to revive it, but 10 years of idleness and decay were too much for their exchequer and it has now gone permanently out of existence.

The Durango Iron Works

Probably no other effort to make iron in Mexico was more promising than that which was located close to the Cerro de Mercado, the mountain of iron ore just outside the limits of Durango, to which reference has been made. For the purpose of any practical industry the supply of iron ore was unlimited, and easily and cheaply mined; in fact, enormous quantities already broken could be shoveled up from the talus of the mountain. A small portion of the deposit would have been ample to maintain a blast furnace for many years, but a large percentage of the capital available by the Mexican National Iron & Steel Company was devoted to the purchase of the property, so as to control it, a procedure which has lately proved to be unnecessary, for ore is now being mined and shipped outside of the limits of purchase. Errors in construction added to the troubles and a considerable amount of money was expended in the purchase of a Clapp-Griffith steel plant, which had been tried and abandoned at Pittsburgh, then put up at Port Henry, N. Y., and finally sent to Durango in advance of the construction of railroad connection there. As a consequence it was hauled 160 miles overland, but was never re-erected and was finally converted into scrap.

With an abundance of ore averaging close to 60 per cent. of metallic iron, which for many years would be delivered at the furnace at 1 cent or less per unit, this plant had an advantage, but no serious effort was ever made, nor was sufficient money applied to secure a fuel supply. Although in late years a branch railroad was built north from Durango for 135 miles, a large portion of which opens up good timbered area, the plant has always been dependent upon the imperfectly burned, dirty and badly broken charcoal made in the woods by Indians, and transported on burro-back to the railroad, except for such time as the furnace was fed with coke from the Coahuila deposits 300 miles distant.

The plant consists of a circular stone blast furnace, Fig. 9, constructed in 1884, topped out by iron extension, its hight being 65 ft., bosh diameter 9 ft. Two steam blowing engines supplied the blast which passed through an iron pipe hot blast stove. There is also a rolling mill with six double coal-fired puddling furnaces with boilers attached, a heating furnace equipped with gas producers using Mexican coal, an 18-in. three-high muck-bar train, and a 10-in. merchant train, which made bar iron for the hardware trade, and a foundry and machine shop well equipped for general business.

Work lately started upon a 125-mile extension of the International Railroad west of Durango will open what is reported to be well-timbered areas, and it may be that the Durango plant will be galvanized into activity.

The property has also been handicapped by disagreement among stockholders and bondholders, a number of whom became such by inheritance, and until the legal procedures necessary to correct this trouble have been perfected the Durango plant remains inactive, but the parties who undertake its rehabilitation must correct the damage due to five years of idleness, or erect part of plant anew, and must meet the unusually favorable ore facilities by providing a satisfactory supply of fuel. Although some individual analyses of the ore from Cerro de Mercado show it to be within the Bessemer limit, the great mass of the ore is high in phosphorus and must be used either for producing foundry iron, pig for puddling, or for conversion in the basic open hearth furnace.

Durango is 540 miles southwest of the Rio Grande, 400 miles west of Monterey, and 860 miles northwest of the City of Mexico. The blast furnace at Durango has produced about 25,000 tons of pig metal, which was transformed at the works into castings, bar iron, &c. With abundant fuel available, this plant in the last 25 years should have made eight times that amount. The Cerro de Mercado has probably contributed two-thirds of a million tons of iron ore for blast furnaces and for flux for silver smelters, but with railroad connections on two sides of the mountain this draft has made but little impression upon the large amount of mineral available.

The Mexican National Iron & Steel Company's original capitalization of $10,000,000 was, on reorgani-

zation, reduced to $5,000,000 and subsequently to $3,000,000, and over $1,000,000 has been expended upon the property in the 25 years of its existence.

Plants in Southwestern Mexico

In the State of Jalisco there are two iron works, one of which is active, the other having lain dormant for a decade or more. This latter, known as the Ferreria de Providencia (Marta Cristos Iron Works), is near Zapotiltec, and about 15 miles from Guzman on the Manzanillo branch of the Mexican Central Railroad, 100 miles south of Guadalajara. The furnace stack is of stone, built in 1875 to smelt red hematites, of which an abundant near-by supply, it is claimed, can be delivered at the plant for $3.50 per ton, while oak charcoal can be obtained in large quantity from the adjacent timber land at a cost of 5 centavos an arroba, or $4.35 per ton. The furnace is 48 ft. high, has 9 ft. bosh, with bottom and top 3 ft. in diameter, equipped with three tuyeres, and has an iron cylinder 25 in. in diameter and 60 in. stroke driven by an overshot water wheel which furnishes cold blast. The rolling mill has one 14-in. train driven by water and one 8-in. train operated by a vertical steam engine. There are two single puddling furnaces, one heating furnace, all wood fired, and six forge fires for producing with charcoal the "platina," a flat bar, bent so as to be transported on burros. This platina is in very general use throughout Mexico, and a ranchman who possesses 50 lb. of it has an asset upon which he lays great store, for he can heat the end of a bar and on a flat stone form it into a point for his wooden plow, a link for a chain, or for any other of the various farm uses to which iron is applicable. This plant cannot be considered as on the active list, although its ore and fuel supplies may encourage its rejuvenation in the future.

The Ferreria de Tula at Tapalpa, Jalisco, is 22 miles north of Sayula, on the Manzanillo branch of the Mexican Central Railroad, and 75 miles south of Guadalajara, and is of modern construction. The blast furnace has a metal shell supported on columns; the bosh diameter is 10 ft., top and bottom 4 ft. diameter, hight 64 ft. It has four tuyeres, the blast being furnished by a steam blowing engine with capacity of 7500 cu. ft. per min. The furnace has two U-pipe hot blast stoves. The ore, which is abundant, is rich red hematite; 15 tons of pig iron per day is obtained with a consumption of 1.2 tons of charcoal per ton of metal. The rolling mill has a 30-in. muck train in one pair of housings; an 18-in. train in four housings, connected to a 10-in. train in five housings; two squeezers, shears, eight double puddling furnaces and two heating furnaces, all wood fired. The power is electricity, developed by a Corliss steam engine and applied to the rolls, &c., the steam being generated in boilers over the furnace. The product of this plant finds a market in Guadalajara, Aguascalientes, Manzanillo and intermediate country, little of it reaching the City of Mexico, about 460 miles distant.

This plant is now owned by Boston capitalists, and the management announces the purpose to erect a new blast furnace capable of producing 100 tons of metal per day, and other improvements, including a railroad to connect the plant with the Mexican Central system, and retorts for producing charcoal. These Jalisco plants are nearly 900 miles from Monterey or Durango by existing railroad connections.

A small blast furnace, producing about 100 tons of charcoal pig annually, was reported as being located some 50 miles west of the city of Toluca. It was recognized as the Ferreria del Salto, employing local hematites and using water as power.

A charcoal blast furnace is now under consideration in connection with a lumber industry in the State of Colima.

The Honey Group of Iron Industries

For 35 years Richard Honey has been prominent in the manufacture of iron in Mexico, having operated in that time eight blast furnaces, four rolling mills and four foundries. These plants were small and the majority of them were located within the populous district of Mexico, the active Honey plants now being confined to the State of Hidalgo and to the Federal district. The Guadalupe, Los Reyes and Trinidad plants in the State of Hidalgo, and the Comanja plant in the State of Jalisco, near the city of Leon, are inactive. The first three works were constructed between 1845 and 1860 and used water power, that of the Trinidad plant having since been diverted for the generation of electricity. It has been claimed that Guadalupe was the first blast furnace erected in central Mexico. The Comanja furnaces were erected in 1865; there were two stacks of cut stone, each 37 x 9 ft.;

Fig. 11.—Interior of a Ferreria (Catalan Forge), Showing the Open Charcoal Fire.

steam power was used, the boiler being fired with wood. This plant has been idle for a number of years.

The Encarnacion and San Miguel furnaces and rolling mills, the Apulco furnace and foundry in Hidalgo, and the Delicias rolling mill, in the City of Mexico, are operating. The Hidalgo plants employ charcoal, largely made from oak, as fuel for the blast furnaces, and in two of them iron is puddled, using wood. Charcoal is purchased by weight, the standard being the arroba, approximating 25 lb. Wood is paid for by the tarea, 1 c. m., or the querda, 1½ c. m. The puddling furnaces consume 3½ tareas of wood per ton; that is, about one cord of wood is necessary to puddle, and about half a cord to heat 1 metric ton of product.

The Encarnacion Plant

At the Encarnacion plant in the district of Zimapan, Hidalgo, is a blast furnace, a masonry structure built in 1892 to replace a former one constructed in 1850, which is 37 ft. high, the bosh having a diameter of 9 ft.; cold blast is supplied by rotary blower operated by steam generated in a boiler which utilizes the waste heat from the tunnel head. The ore is mostly a rich magnetite from the neighborhood, averaging over 65 per cent. of iron, to which sufficient leaner material is added to assist in the furnace operation. An average

of 33 charges per day aggregating 9.46 tons of iron ore, 6.38 tons charcoal and ½ ton of limestone are fed to the furnace, producing therefrom 5.63 tons of pig iron. The rolling mill has two single puddling furnaces, an 18-in. roughing train and an 11-in. finishing train, driven by a steam engine, the steam coming from boilers over the furnaces; also a 1-ton steam hammer This mill produces angle irons up to 3 in., merchant bar and also platina, previously described.

The brand Encarnacion has long been the standard for wrought iron in the Mexican market. A test of ⅞-in. round bar gave an elastic limit per square inch, 45,410 lb.; tensile strength, 55,260 lb.; elongation in 8 in., 21.12 per cent.; reduction in area, 41.1 per cent.; fracture, fibrous.

Originally the product was hauled by team to the City of Mexico, and after railroad connection was made to Pachuca this was the shipping point. A railroad is now being constructel by Mr. Honey which will further shorten the wagon and tram-road haul for the product of the Encarnacion plant.

San Miguel Plant

In the district of Zacualtapan, State of Hidalgo, is the San Miguel plant, consisting of a blast furnace 32 by 8 ft. 9 in., built in 1859, which is operated by cold blast obtained by water power, using local hematite ores and charcoal, the product being 4.65 tons of pig metal per day, which is converted into merchant bars, angles, &c.

To produce this amount of iron there was fed to the furnace 8.54 tons of ore, 1.22 tons of limestone, and 6.62 tons of charcoal. The rolling mill has two wood-fired puddling furnaces, one reheating furnace, one 15-in. train, one 11-in. train and a 1-ton hammer, the machinery being operated by steam generated in boilers over the mill furnaces.

A concession has been granted for a railroad connecting the San Miguel and the Apulco plants, which will open up the timbered areas, giving additional fuel and ore supplies to these two works.

The Apulco Plant

The Apulco plant, Fig. 10, is the only one of the Honey group in Hidalgo which has direct railroad connection. It consists of a blast furnace, foundry and machine shop. The furnace is a stone and adobe stack 45 ft. high, 8 ft. bosh, operated with cold blast supplied from iron blowing tubs driven by a Pelton water wheel. During the month of January the furnace record showed that 287 tons of iron ore, 30 tons of limestone, and 289 tons of charcoal were fed to the furnace, the product being 189.23 tons of foundry pig iron. The local limonite upon which the furnace relies is delivered by burros and is enriched by a high grade hematite from the State of Guerrero, brought by railroad to Apulco.

The advance in iron manufacture in Mexico has been slow, and in the interval of 11 years between two visits to Apulco furnace there was but little change noted, except the substitution of a Pelton wheel under high head for an overshot water wheel under low head, and the addition of modern tools in the machine shop, to fit up some excellent castings made directly from the blast furnace or from a cupola. The buildings were covered with the same long wooden shingles, held in place by wooden pegs; most of the ores, charcoal and flux came to the furnace on the backs of mules and burros, the ore and stone being hand broken to nut size, mostly by women who earned 10 cents per day; all materials were fed by hand into the throat of the furnace by measure, the charcoal in baskets, the other material in boxes. Much of the metal was ladled from the open fore hearth and cast into delicate patterns, such as garden seats, brazeros (charcoal ovens) and plows, and a cupola also remelted the metal which had been run into pigs and cast it into water pipes and other large forms.

The mechanical ability exhibited by the Mexicans argues well for an iron industry, for in this plant, as well as others visited, superior workmanship is evidenced in the castings and in materials passing through the machine shop.

The continued activity of some of these older plants, in spite of the establishment of a large modern steel industry at Monterey, demonstrates the accepted superiority of their products, made at low cost by crude methods, but they cannot be expected long to maintain existence against prospective advances, although it must be admitted that in a country where labor is abundant, so efficient, so cheap, and which can be so well directed as in Mexico, labor-saving appliances prove less important than in the United States. But improved equipment and operation also reduce the consumption of material, and this added to the smaller labor item will be apt to relegate the older plants to the list of the "has beens." Recognizing this condition, Mr. Honey decided upon improvement of his plants, and a fire which destroyed a part of the buildings at Apulco made the time opportune for carrying these improvements into effect. Plans are now being drawn for a modern blast furnace, equipped with iron pipe hot blast stoves at Apulco, in which foundry pig iron will be made, and also for the modernizing of the furnaces at San Miguel and Encarnacion.

Delicias Plant

In the City of Mexico is the Delicias rolling mill, owned by Mr. Honey, which has a gas fired heating furnace, one 12-in. train and one 9-in. train. The material used is scrap iron; the producer fuel is imported coal and the power to operate the rolls, shears, bolt cutting and nut tapping machines, &c., is obtained from motors connected with the electric system which supplies the City of Mexico. The product of the mill is rounds up to 1⅞-in., squares to 1½-in., flats to 3 x ¾ in. and angles and tees 2 in. or under.

Electric Furnace

Mr. Honey has contracted for an induction furnace capable of producing 2½ tons of steel per heat, and is having plans prepared for remodeling the Delicias mill, adding an open hearth furnace, an enlarged heating furnace, and an additional train of rolls. This equipment may form part of a projected industry in the valley of Mexico, which will include a new blast furnace. The electric furnace may be operated with cold metal, such as old car wheels, but the project is to use it in connection with the open hearth furnace, for the purpose of producing special high grade steels for stamp shoes, dies, &c.

The Delicias foundry and machine shop adjoining the rolling mill is owned and operated by Thomas Phillips. It has two cupolas of 3 tons and 1 ton per hour, respectively, and a well-equipped machine shop.

Other Industries

In addition to the rolling mills and foundries connected with Mexican blast furnaces, there are several plants which produce bar iron, and foundries are located in most of the important cities, at the shops of the railroad companies and at some of the prominent mines.

As an evidence of the mechanical skill of the native Indians, the statement is made that at one of the large silver mines machetes have been cast from a cupola, ground to a sharp edge, and are quite serviceable, unless a blow is struck which brings a transverse strain on the metal.

Of the rolling mills, that at Chihuahua, 225 miles south of the Rio Grande, and 1000 miles north from the City of Mexico, consists of a 30-ton tilting open hearth

furnace with gas producers, fed with scrap and ore, producing ingots, which, after passing through a gas fired heating surface, are rolled into merchant shapes by means of a 12-in. and an 8-in. train.

The National Railway maintains a rolling mill and a shop at Aguascalientes, 300 miles from the capital, as a medium of utilizing part of its scrap, and producing some of the material for its own consumption. It has two oil-fired heating furnaces and a 9-in. merchant train.

In the City of Mexico Valentin Elcoro & Sons have two coal-fired heating furnaces and a 16-in. train, producing small merchant bars, angles, &c., from box piles. The output is from 25 to 30 tons per week. There is also a well-equipped foundry and machine shop connected with the plant.

Imported wire rods are converted into nails at San Luis Potosi, Monterey and Guadalajara.

A Mexican Ferreria

The above sketch of Mexican iron works will carry the reader back more than half a century, to the time when cold blast charcoal furnaces were numerous throughout the eastern United States, but in Mexico it is to-day possible to hark much further back and find in the mountains ferrerias, which are really the ancient Catalan forges. An adobe building, generally covered with thatched roof, which in some mysterious manner withstands, and has for years withstood, the showers of sparks from one or more open charcoal fires, is located beside a stream which has sufficient volume and fall to insure the generation of blast in a trompe, and the operation of a helve hammer by a water wheel. The air entrained by the water falling in a box forming the trompe is compressed sufficiently to give blast through the tuyere, which accelerates the combustion of charcoal in the forge fire and partially reduces iron ore fed with the fuel, thus forming a loop which is compacted and from which the cinder is driven off under the helve hammer. Subsequent reheating and hammering produce platina bars or anchovies, which are disposed of in markets in the nearby prominent towns at approximately 3 to 4 cents per pound.

Fig. 12.—Exterior of a Ferreria (Catalan Forge) in the Western Portion of the State of Oaxaca. The Dam in the Background Furnishes Power to Operate the Hammer and Supply the Blast Through a Trompe.

To supply these forges of ancient type, and also most of the charcoal furnaces, the fuel is prepared by Indians who fell trees and form small meilers in the woods where the charcoal is produced. This prevents a good yield from the wood, and the charcoal is much broken in being transported to the iron works in bags, either on the backs of peons or on burros or mules. The iron ores are dug in small quantity, are used as extracted, and are similarly transported, although in some cases oxcarts are employed, but, except in northern Mexico, none of the iron ore deposits have railroad connections. In late years there has been an attempt in modernizing some of the charcoal furnaces; two of these are supplied with hot blast and the rolling mills connected to them are also modern in construction.

To obtain information concerning the ferrerias it is necessary to make long journeys into the mountains, with the chance of finding the owner absent or dead, and no one able or willing to give the information; in fact, most of the ferrerias are operated by remnants of the old Mexican tribes, speaking dialects peculiar to themselves. One of these ferrerias is reported as active on the slopes of Popocatapetl, in the State of Puebla.

The San Rafael has three fires, one of which is used for reducing ore and the others for refining iron; it is located in the central part of the State of Oaxaca, and its annual output is reported as 600 quintals, or about 30 tons. The metal sells at from 9 to 10 pesos per quintal, or 4½ to 5 cents per pound. Figs. 11 and 12 are reproductions of photographs taken at San Rafael.

Another ferreria is located a few miles from the city of Tlaxiaco in western Oaxaca, and two others are near San Miguel Plumas in southern Oaxaca. There is also one in the same state near Zeniza in the district of Zimatlan, consisting of a small blast furnace about 15 ft. in hight, which produces about 3000 lb. of pig iron per week when running, the charge consisting of 200 kg. of ore, 200 of charcoal, and 30 of limestone. The charcoal costs 7 centavos an arroba, or a little over $3 per metric ton. The ore is a rich magnetite and the pig iron is refined with an equal weight of charcoal and hammered into bars weighing about 25 lb., which command about 4 cents per pound. The plant also makes castings, the market for its product being the city of Oaxaca, which is reached by burro trail.

Altitudes of Iron Works

Interesting features in connection with the existing iron works in the republic of Mexico are their elevation above sea level and the influence of dry rarified air upon the amount of moisture carried into the furnace on the boiling point of water and upon the vacuum possible in condensation.

The blast furnace connected with the steel plant at Monterey has the least altitude above sea level of any of the Mexican iron works, it being 1600 ft. above tide. The furnace at Durango is 6300 ft.; that at Tula 7300 ft.; the Encarnacion furnace in Hidalgo 7650 ft.; in the same state, Apulco furnace, 6950 ft.; San Miguel, 5400 ft.; the City of Mexico being 7250 ft.

In the United States the furnaces of the Colorado Fuel & Iron Company at Pueblo are at the greatest altitude, 4600 ft. above sea level, and but few others are at at altitude greater than 1000 ft., the majority being at elevations ranging from sea level to 600 ft.

Conclusions

From the above the following may be assumed:

1. That Mexico awaits improvement in its iron and steel industry.
2. That a market for greatly increased output exists.
3. That the Government favors and assesses customs duties which will protect domestic manufactures and prevent destructive competition.
4. That geographical conditions demand freight

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charges in overcoming distance or elevation to reach the centers of consumption, which give additional protection to advantageously located domestic industries.

5. That iron ore is abundant and much of it of superior quality.

6. That labor is plentiful and as a rule easily taught and willing to work.

7. That although the prices paid for mineral fuel are above what prevail in the United States, there are localities where this, or charcoal, can be obtained at costs which admit of the production of metal at satisfactory prices.

This list of favorable conditions, however, is not enumerated with the expectation that a knowledge of them may encourage a "boom" in the establishment of iron and steel industries, for it is fully as important in Mexico as elsewhere to give each suggested improvement and each selected location careful investigation.

The Mexican people are not given to accepting changes readily, and while the per capita consumption of iron and steel products will increase, this augmentation will not be by leaps and bounds. The phrase *"No es la costumbre"* may be applied to the use of metals, as to other features of Mexican life, and notwithstanding the *"pro patria"* sentiment in the republic the abandonment of brands which are known for others which are new is not to be expected to be precipitate.

Neither is it believed that the best results will follow the wholesale importation of foreigners to operate the industries nor the installation of large plants as initiatives. The rehabilitation of some now existing works, or the erection of new ones of moderate capacity, with the provision of future enlargement, seems to offer the best chances for success, and while labor-saving appliances are not as essential in Mexico as in the United States, where the prevailing wage rate is four to six times as great, the environment demands that the equipment should be of high class.

A number of visits, covering a period of 28 years, and which embraced different sections of Mexico, have given opportunity to study the country, its people, its resources, its industries and its possibilities and to note the progress which has been made, to appreciate the causes of failure, to recognize the basis upon which success was obtained, to see improved conditions follow industries judiciously planned and managed. As popular education is extended, as the inborn ability of the workmen is utilized, and as the resources of the country are developed, the manufacture of iron and steel will expand, the per capita demands for such products will be augmented, and the wage rate will be increased.

The Geyser Rotary Pump

A pump which is constructed on an entirely new principle has been invented by George F. Westcott and is being marketed by the Paradox Equipments Sales Office, White Building, Buffalo, N. Y. The accompanying illustration shows the construction and operation of the pump very clearly. It may be used to pump either water or air, and has such special applications as tree spraying and vacuum cleaning.

The principal parts to this pump are the cylindrical casing containing the inlet and outlet, the impeller, an oscillating abutment which for convenience may be called a valve, and an eccentric on the driving shaft for operating the impeller. In operation the water or air enters the cylinder through the inlet A, and is prevented from passing over the impeller by the valve C, which is cylindrical, but cut away on one side to admit the impeller. This valve is fastened to the impeller D and keeps the latter from revolving. The eccentric E, which is fastened to the shaft by a key, transmits a gyratory motion to the impeller with practically no rotation of the latter; ball bearings are interposed between the two parts to reduce friction. The motion of the impeller displaces the air or water forcing it out through the outlet B.

When pumping air the pump is water packed by a small stream which enters with the air into the cylinder, and when pumping water a certain amount of entrained air is carried in which enables the water to be pumped to a greater hight without excessive power. For spraying trees the additional equipment required consists of a tank with pipe connections to the pump

Phantom View of the Westcott Geyser Pump, Sold by the Paradox Equipment Sales Office, Buffalo, N. Y.

and the spray pipe, and it is claimed that with this pump sprayer mixtures can be pumped 40 ft. without drop, and the use of the needle point is done away with as the solution is mixed with air and sprays from the hose. The vacuum cleaner equipment consists of a receiver for the dust, the collecting tools and the necessary hose for making the connections.

Units of this character can be driven by electric motors, gasoline engines, or any other power available. Where increased capacity greater than that of a single pump is required, siamese inlets and outlets are furnished, and two pumps placed side by side with a common driving pulley between them, or they may be arranged in series.

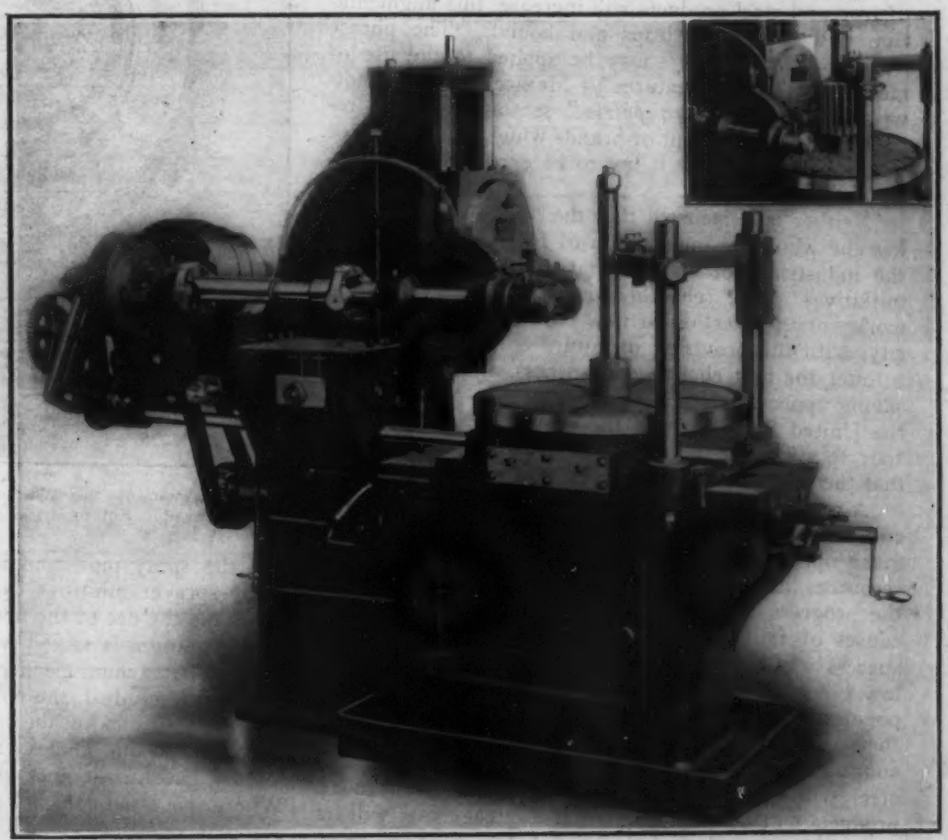
Machinery Exhibition in Berlin, Germany.—A special exhibition of machinery, tools, leather, and all kinds of materials used in the manufacture of belting will be opened October 9 next at the Luisenhof, Berlin. The American Chamber of Commerce at Berlin states that leading German, American and English firms are said to have already secured space. Applications should be addressed to A. Frommeyer, Hanover, Germany.

The new oil-burning torpedo boat destroyer Paulding, at its trial trip September 2 off the coast of Maine, exceeded the contract requirement of 29.5 knots by 3.3 knots, maintaining an average of 32.8 knots an hour during her four-hour run at top speed. This vessel was built by the Bath Iron Works, and has thus been shown to be superior to the new coal-burning destroyers Flusser and Reid, which were also built at the same plant.

The Farwell No. 3 Gear Hobber

The first of a line of gear hobbers built by the Adams Company, Dubuque, Iowa, was described in *The Iron Age*, June 4, 1908. Now a much heavier machine, known as the No. 3, has been added to the line, which is capable of handling work up to 24 in. in diameter, three pitch, cutting 12 in. of face at a time. As may be seen from the accompanying illustrations the head has an unusually long bearing on the housing and the spindle has no unnecessary overhang. The spindle has adjustable bronze bearings of liberal diameter and length and is very rigidly secured to the saddle. In fact the compact and rigid support of the spindle is considered a feature of the Farwell gear hobber.

A change in the design of this machine, brought about by the intention of handling coarser pitches than the No. 1 machine, is the providing of a slide in the saddle that carries the hob, making it possible to adjust the hob spindle longitudinally, so that any tooth may be placed exactly central with the work arbor. This adjustment is quite important to the obtaining of perfect gears of coarse pitches, but does not require attention for gears of fine pitches, as the difference in position of two succeeding teeth then is not sufficient for the neglect of adjustment to be noticeable in the gears. The longitudinal movement of the spindle head permits also the shifting of the hob to a new cutting position without resorting to moving the hob or the arbor. Several shifts may be made bringing sharp cutting parts of the hob into action before it is necessary to grind the hob.



The Farwell No. 3 Automatic Gear Hobbing Machine, Built by the Adams Company, Dubuque, Iowa.

An automatic trip on the head stops the downward feed when the cut is finished and the head is raised by power ready for the next cut. This return of the head is necessary only once for each stack of gears cut, and on the smaller machine is accomplished by hand. There are two extra feeds on the No. 3 machine, making 10, all of which are obtained in the gear box. A horizontal feed mechanism is incorporated in the machine for cutting worm wheels and a special support is also furnished for the upper end of the arbor. Use of the latter is necessary only when gears must be swung on centers, or for wide face gears or for cutting a stack of gears of small diameter. A more rigid support can be secured in other cases by using face plates or supporting rings which rest upon the table and support the blanks immediately below the rim.

The spindle is driven by a bevel gear instead of by belt as in the first machine, as the coarser pitches necessitate tilting the hob to a greater angle than the belt drive would allow. This angle and the tooth depth are set with a hardened steel gauge as on the smaller Farwell gear hobber. All important bearings have bronze bushings and the spindle and arbor bearings may be adjusted by loosening a lock ring and tightening an adjusting ring nut.

Exceptional rigidity is insured by the design of the base and column, these and the knee below the table and the oil pan around the machine being a single casting. The weight of the machine is about twice that of the No. 1 hobber, or over 2000 lb. A large tank for lubricant is inclosed in the base and ample passages are provided to conduct the lubricant from the table back to the tank. The lubricant pump is gear driven and has means for regulating the flow of the lubricant. All gears are provided with shields as is also the universal joint shaft.

The Mexican Iron & Steel Company

GUADALAJARA, MEXICO, September 1, 1910.—The iron industry of the Mexican Iron & Steel Company, known as the Ferreria de Tula, at Tapalpa, in this State (Jalisco), is having a steady growth. The company is composed of Boston, Mass., men who acquired the property about a year ago from Daniel Ochoa. In addition to the iron mines, the blast furnace and the rolling mill, the company purchased a large tract of timber and ranch land from Mr. Ochoa. Many orders have been received by the company and the plant is kept constantly running to its full capacity. Recently the Corcuera family, which owns a very large plantation, gave an order to the company for 10,000 forged plow points, which are to be adjusted to the typical Mexican wooden plow. There is talk of engaging in the manufacture of steel tools as well as of erecting a steel plant at the furnace, but no definite step has as yet been taken by the company.

The officials of the Jewell Steel & Malleable Company, Buffalo, N. Y., have finally decided upon the location of its plant, which will be at the southwest corner of Military road and Hertel avenue on a 4-acre site having New York Central Railroad connections. Construction has already begun. The main building will be 130 x 140 ft., of brick and iron.

The Scully Steel & Iron Company's Warehouses

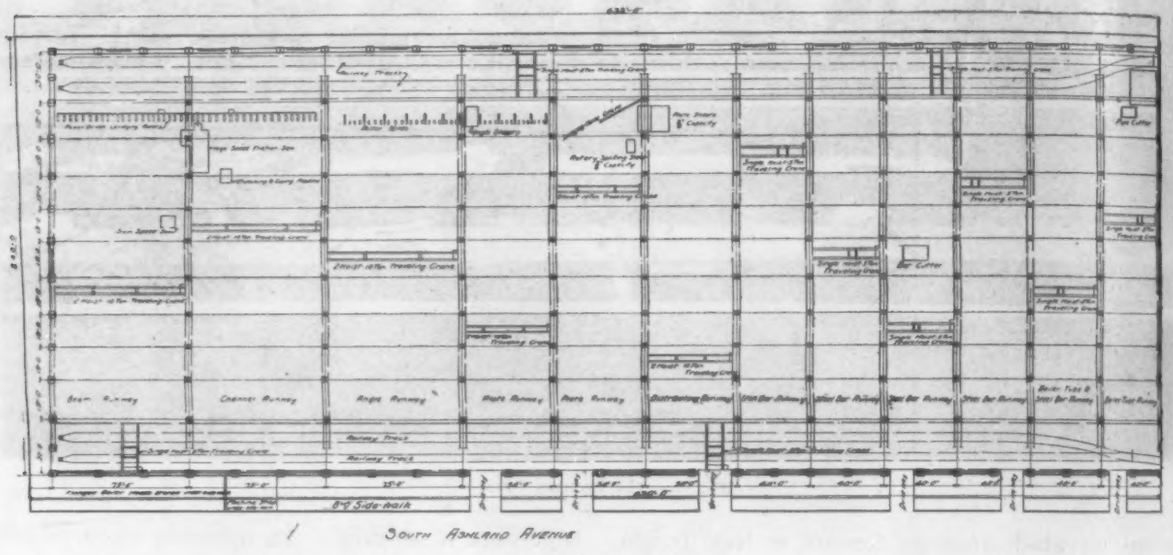
Features of an Important Storage and Handling Plant of the Chicago District

The new plant of the Scully Steel & Iron Company, Chicago, possesses noteworthy advantages for shipping. The property has a frontage of 289 ft. on the south branch of the Chicago River, and a "slip," as it is called locally, an excavated channel, extends 1700 ft. north from the river along the warehouse property, including a vacant portion on which the buildings may be extended to provide for the growth of the business. Any boats which can enter the Chicago River can be taken up to the company's plant, where the freight can be unloaded directly into the main warehouse. Large cargoes of iron and steel were received in this manner the past summer from Eastern mills, as the Eastern railroads favor this traffic by operating their own boat lines and making lower rates than by all-rail routes.

In railroad facilities the plant is equally favored. There are three railroad sidings for loading and unloading cars. Two of them, one on each side, extend the full length of the plant, while the third runs through the middle of the north warehouse with platforms on each side for handling material in or out of cars. These tracks are "pulled" twice a day, and the mechanical equipment for loading and unloading is so complete that 57 cars have been unloaded in one day. A carload of pipe has been unloaded and stacked in 23 minutes. In handling iron and steel in a large plant the cars often come in bunches, owing to delays in transit in the case of shipments from Eastern points. There is a great commercial advantage in being able to take care of the material as fast as it comes in sight.

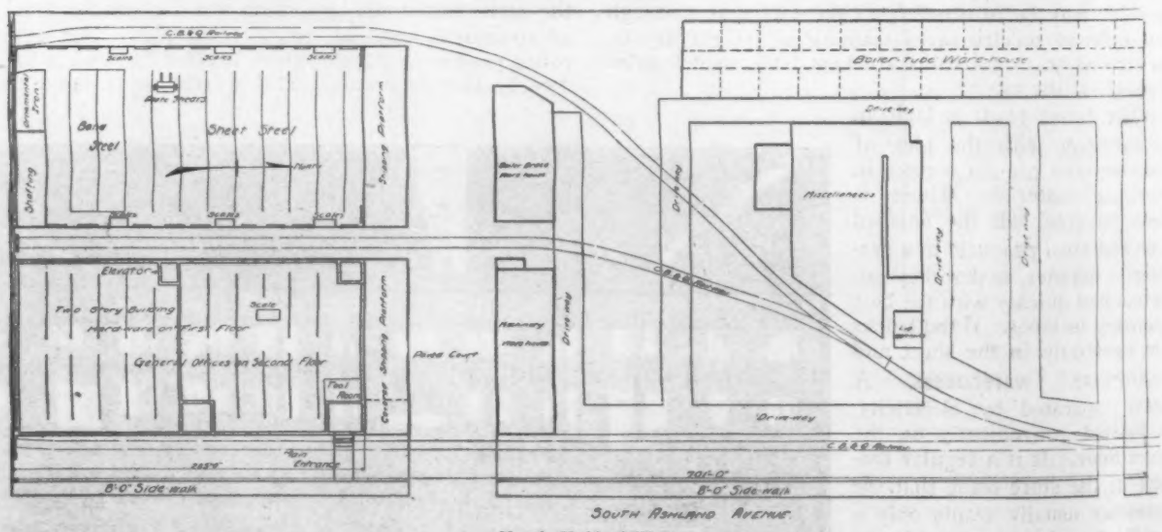
For handling outgoing shipments the railroads have established a special service which avoids drayage expense and promotes economy on less than carload lots. These shipments are loaded in local freight cars, one for each road, in such a way that they leave the plant

(Slip 100 ft. wide and 1700 ft. long, navigable for large boats.)



South Half of Plan.

(Slip 100 ft. wide and 1700 ft. long, navigable for large boats.)



North Half of Plan.

Fig. 1.—Plan of Warehouses, Offices and Shipping Yards of Scully Steel & Iron Company, Chicago, Ill. (The Lower Half of the Plan Is the Continuation, to the Right, of the Upper Half.)

Fig. 2.—The General Office.

in carloads which often go forward in local freight trains without rehandling the material. This service is only possible in a large shipping center like Chicago, where sales of iron and steel from store run into large figures in daily tonnage. The amount of business done in a day may be inferred from the fact that although this railroad service saves teaming to freight depots, as high as 30 to 40 teams are kept busy on deliveries throughout the city.

The entire plant is laid out in harmony with the idea of economy and prompt service in handling material. There is room to stack all the finished iron and steel products in a systematic manner, so that they can be handled quickly with the best economy in labor. Hand trucks are used only in the sheet and "hardware" warehouses. A shear, operated by electricity, is located conveniently on the sheet floor. It is a regular feature of the store trade that the customer usually wants only a small lot, and is in a great hurry for it. The largest manufacturing plants in Chicago are always running out of something which they want immediately, and a part of the service of store distribution is to get the order ready and a wagon on the way with it within a very sort time after a rush order is received on the telephone. The Scully plant is designed to meet this demand by carrying a very large stock of all gauges and widths of sheets, which can be cut to special sizes on a moment's notice, and an equally complete stock of heavy bolts, spikes, tools and other articles generally classed as heavy hardware.

The new feature of the Scully plant, however, is in the main warehouse, in which are carried the stocks of structural material, tubes, bars, plates and other rolled products. All this stock is piled flat, and is handled by electric cranes. This warehouse is 240 x 639

Fig. 3.—The Bar Bay.

ft., extending north and south, with a railroad track inside the building on each side, and a river dock at the south end. The storage space is laid out in 12 bays, or "alleys," extending east and west the width of the building. Three of these bays are 75 ft. wide, three 50 ft. and six 40 ft. The 75-ft. bays are used for beams, channels and other long, heavy structural material, which usually runs in 60-ft. lengths, while the other bays are used for shorter material and pipe. The stock is laid in piles running north and south, across the bays, stakes being used to separate the piles wherever necessary, as in the case of pipe.

Fig. 4.—The Friction Saw.

Fig. 5.—The Angle Shear.

Over each of the 12 bays runs an electric crane, which covers the entire bay and the railroad tracks at each end. The material is unloaded from the cars with these cranes and laid in its proper place in the bay, so that each size and section of stock is kept in order. Three Cleveland cranes of 10 tons capacity are used on the wide bays for heavy structural steel, the others being Whiting cranes of 5 tons capacity. There are also two cranes which run north and south the entire length of the warehouse, on the west side over the railroad tracks. These are used in transferring stock from one bay to another, as well as in loading or unloading cars and carrying material to or from the saws or shears. They are also used in carrying to the north warehouse the lots of material which go out on wagons or in cars which are loaded outside the main warehouse. No fabricating work is done here, but the plant is equipped with a friction saw for cutting heavy stock, as well as a slow saw, a heavy punch, and shears for cutting angles, bars, plates and tubes.

An interesting feature in the office of the company is the extent to which steel has been used for furniture and fixtures. The main office is one large room, 100 x 150 ft., divided into departments by low steel partitions of counter hight. The desks, filing cases and other fittings are all of steel, and even the doors and door casings are of steel. The general artistic effect is evidence that the manufacturers of steel furniture and fixtures are making great progress in their art. All the exposed steel surfaces are enameled with a mahogany finish, and it is done so perfectly that one has to look closely to make sure it is not mahogany. The columns are covered with ornamental pressed steel with the same finish, and the general arrangement gives the office an artistic "tone" which is very pleasing. The officers of the company have private offices, opening from the north end of the main office, but emphasis is laid on the fact that the doors of these offices are always kept open, especially to employees.

While there is good light from each side, the general office has a large skylight in which the glass has been given a coat of gray paint, which has the effect of softening the light. At each end of this skylight is a large ventilating fan, one blowing in and the other out. The heated air under the skylight is thus carried out and a constant supply of fresh air is drawn in.

South of the main office are the restaurant, the gymnasium and the lavatories. The same food is served to all the office employees, numbering about 100, but the price is graduated, running all the way from 10 cents for an office boy to 50 cents for a department manager. The company loses a little money in conducting the restaurant service, but every one gets a square meal and the service is appreciated, as there are no outside restaurants worthy of patronage in this part of the city.

Automobile Standardization

To meet the imperative demands of the automobile industry there has at last been set on foot a movement looking to its permanent standardization. This work, inevitable in its necessity to an industry now fifth in the scale of industries, and one growing by leaps and bounds, is to be conducted by the Society of Automobile Engineers, 1451 Broadway, New York, of which Coker F. Clarkson is general manager. Following the decision made at the recent meeting at Detroit, the Standardization Committee of the society has been organized as follows: Howard E. Coffin, president of the society (*ex-officio*); Henry Souther, Hartford, Conn.; James H. Foster, Hydraulic Pressed Steel Company, Cleveland, Ohio; H. S. White, Detroit Seamless Steel Tubes Company, Detroit, Mich.; Charles T. Jeffery, Thomas B. Jeffery & Co., Kenosha, Wis.; Elwood Haynes, Haynes Autumobile Company, Kokomo, Ind.; H. W. Alden, Timken-Detroit Axle Company, Detroit, Mich.; Arthur Holmes, H. H. Franklin Mfg. Company, Syracuse, N. Y.; W. H. Van Dervoort, Moline Automobile Company, East Moline, Ill.; D. F. Graham, New Departure Mfg. Company, Bristol, Conn.; G. E. Merryweather, Motch & Merryweather Machinery Company, Cleveland, Ohio; A. C. Bergman, Simplex Automobile Company, New York; Coker F. Clarkson, secretary, 1451 Broadway, New York. This committee will be enlarged as shall be found necessary. Various subcommittees will be actively engaged throughout the country on component parts of motor cars which can be properly standardized at this time. These matters cover a very broad field, including raw materials, machine tools, semifinished and finished parts, engineering methods and practices.

The work of the committee involves an immense amount of detail. Proper standardization will mean a tremendous saving to the industry and the public, for it spells efficiency, bettering quality, reducing cost and facilitating production. It means interchangeability, highly valuable to producer and user. Persistent application for several years by the most capable automobile engineers working jointly has resulted in the establishment of only a few standards, some of which have not been widely adopted; these are known as the A. L. A. M. screw standard and drill sizes, spark plugs, solid and adjustable yoke and eye rod ends and horsepower formula. Subjects now in hand by the Standardization Committee are as follows: Specifications and heat treatment of automobile materials; indexing and digesting of automobile engineering literature; compilation and publishing of an automobile engineer's hand-book or pocket book; seamless steel tubing; sheet metal; lock washers; limits for screws and taps; round cornered square holes and keyways; brake and clutch lever forgings; practice in plain and anti-friction bearings; wood wheel dimensions and fastenings for solid tires; shackle bolts; carbureters; flanges outlets, bolt hole center distances, cap screws, gasoline connections, throttle levers and holes, water connections and gaskets; automobile nomenclature; frame sections. The matter of sheet metal alone involves the consideration of the chemical composition; dimensions and standard of measurement of clutch disks, brake drums, body panels, mufflers, radiators, fenders, hoods, sod pans, fan blades, hub caps, dashes, steps, running boards, miscellaneous stampings and many other parts.

Fig. 6.—The Stock of Beams and Channels.

The Llano, Texas, Ore Field

AUSTIN, TEXAS, September 2, 1910.—The Wakefield Iron & Coal Land Improvement Company, Milwaukee, Wis., which has just been granted a permit by the Secretary of State to do business in Texas, has been interested in the iron ore fields of the Llano district, 100 miles northwest of here, for several years. It has a large iron ore property near Llano that is in a partial state of development. During the past year the company has conducted extensive exploration work by means of diamond drills, and it is said that it has proved an ore field of such extent and high brade as to warrant the erection of blast furnaces. The company has a capital stock of $250,000. The plans for a furnace are said to have been drawn.

There is a good prospect of the Llano iron ore field being placed in direct touch with the Thurber coal fields, situated to the north about 150 miles. It is also claimed that there are extensive deposits of good coking coal within less than 100 miles of Llano. Two or three railroads are now projected into the Llano section from the north and west.

President Henry B. Joy of the Packard Motor Car Company, Detroit, Mich., is quoted as follows by the Boston *News Bureau:* "I do not feel that the future is clear for American industry in general. Political disturbance is rife. Two Presidents are too many for one nation. Stability and confidence in the future are prime requisites for industrial development, and these do not exist. So far as the Packard Motor Car Company is concerned it will during the current quarter do the largest business of any three months in its history. We have no specific output, our business depending largely on the nature of the vehicles ordered of us. We have cut in half a factory enlargement programme by reason of the disturbed political outlook."

Steel for Rails

A paper on the above subject was presented at the recent International Congress of Metallurgy at Duesseldorf by Pierre Breuil, a Carnegie medalist of the Iron and Steel Institute and now secretary of the Hainaut Works at Couillet in Belgium. The paper is largely a review of the more recent work on the subject and great prominence is given to American specifications, research and results. Following is an abstract:

On the Continent the amount of carbon rarely varies with the weight of the rail. It is lower than in America and ranges from 0.35 to 0.50 per cent. The phosphorus is usually from 0.075 to 0.080, and the silicon is held generally at 0.10 but varies from 0.05 to 0.20.

In regard to the wear of rails in service, M. Couard has worked out a formula based on the results of many years' observations in service. He believes that the wear of the head is proportional to the average tonnage of the trains, the average speed, the bending of the rails between their supports, to the grade, and finally

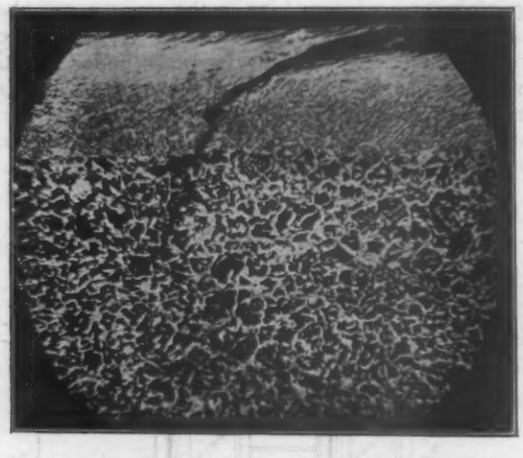


Fig. 1.—Longitudinal Section, Magnified 35 Diameters.

to a coefficient varying with the nature of the steel. His formula is:

$$N = \frac{100}{Tv} \times \frac{1}{L^3} \times \frac{1}{1 + AD^2} \times C.$$

N = the number of trains answering to a loss in hight of the head of the rail to 1 mm. (0.039 in.)..

T = average tonnage of the train in tons.

V = the average speed, using kilometers, per hour.

I = the moment of inertia of the section in centimeters.

L = the distance between the ties in meters.

D = the grade in millimeters per meter.

A = a coefficient which is 0.023 for an up grade and 0.012 for a down.

C = a coefficient varying with the source of the steel.

The coefficient C was 1.4 for a certain brand of rails on M. Couard's road. For this steel 200,000 trains will give a wear of 1 mm., the average weight being 200 tons. When the brakes are applied the wear is five times greater. The most important causes of wear are the increasingly heavy wheel loads and the greater speeds. Theoretically, the wheel only touches the rail at one point, so that the pressure on this small area is very great, bringing about permanent deformations, tears in the crust of metal which has lost its malleability and various phenomena of flow. Some experiments have been made, which are worthy of mention. Under the heavy wheel loads, applied on a small area, the metal in the rolling surface is subjected to stresses above the elastic limit and tends to flow.

In all cases a crust is formed. It appeared of interest to endeavor to determine to what depth the hardening action extended. A double headed rail was taken, the analysis of the steel being carbon, 0.54; manganese, 1.00; sulphur, 0.08; phosphorus, 0.144. It had been in service 28 years. From the rolling surface successive layers were removed, 1 mm., 0.039 in. thick. On each step three Brinell tests were made, using 3000 kg. pressure, and a 10-mm. ball. The results are given below, that of the lower head being 207:

	Position of Test.		
Number.	On side outside of track.	In center.	On side inside of track.
Rolling surface....	269	277	302
1.....	293	286	277
2.....	277	269	293
3.....	255	241	269
4.....	228	223	228
5.....	228	212	217
6.....	228	217	228
7.....	228	207	228
8.....	223	207	223

In each case the results at the side of the rail are higher than those in the center. The hardness diminishes regularly in the center, and the hardening influence extends to a depth of 6 mm. (0.24 in.).

A microphotograph, Fig. 1, shows the exterior crust to be only about 0.019 in., this method of examination failing to show the mechanical changes the metal has undergone, but it does show the flow to have taken place in a direction contrary to the direction of the track. It also shows a crack following the line of flow, and extending into the unaltered steel below. These cracks may be seen with the naked eye, if the rolling surface is brushed and washed with benzine. A light polishing and etching develops them, as shown in Fig. 2. If the rail is etched in dilute hydrochloric acid, the fissures are eaten away and become very plainly visible.

These facts merit the attention of all those making and using rails. If the rail is bent with the hardened

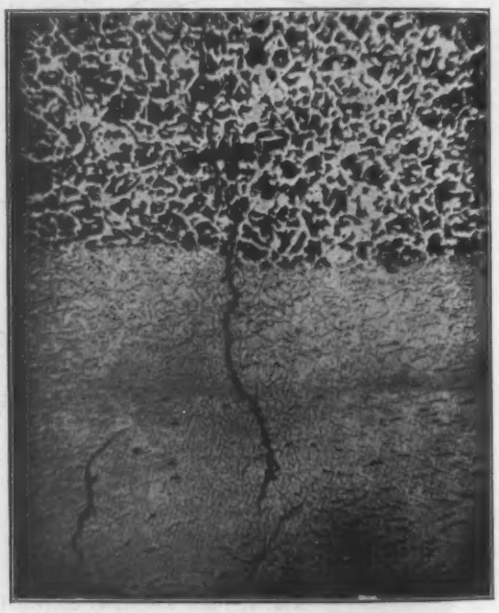


Fig. 2.—Showing Hardened Crust and Fissures, Magnified 35 Diameters.

crust in tension it breaks off short; if the other way it gives a good bending angle. Small tensile tests taken from the surface give no elongation, while those from the center of the head give 18 to 20 per cent.

G. B. W.

The reported locomotive orders for last week comprise but three engines. The Dold Refrigerator Car Line is in the market for 50 steel underframe refrigerator cars, while the Mexico Northeastern is reported to want 200 logging cars and the El Paso & Southwestern 11 cars. The Chicago, Milwaukee & Puget Sound is reported as ordering 250 logging cars from its company shops. New equipment business is exceedingly light.

Buffalo Multistage Turbine Blowers

A large amount of air at pressures ranging from 8 to 16 ounces per square inch is required for cupola blast. To furnish this, most centrifugal blowers are required to run too fast for direct connection to electric motors. By providing two or more stages in a turbine blower, the Buffalo Forge Company, 490 Broadway, Buffalo, N. Y., has succeeded in lowering the speed sufficiently for direct motor operation. Fig. 1 is an exterior view of one of these units, and Fig. 2 is a sectional elevation showing the constructional details. With this blower small capacities at high pressures are easily obtained at moderate speeds, for by using two or three stages the speed can be reduced to that corresponding to one-half or one-third, respectively, of the total pressure. At present a number of these blowers are installed in different foundries, railroad shops and steel plants.

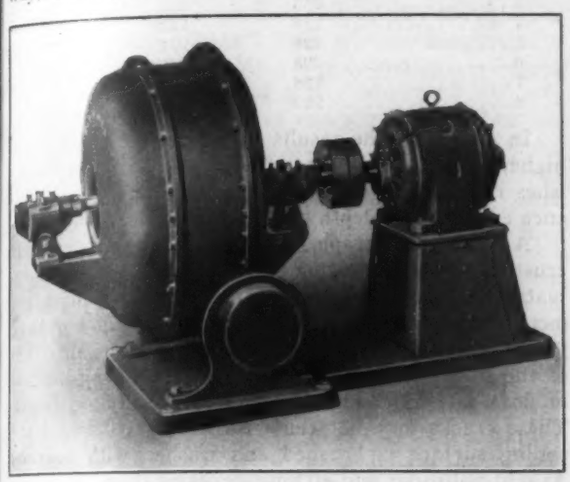


Fig. 1.—A Two-Stage Turbine Blower Built by the Buffalo Forge Company, Buffalo, N. Y.

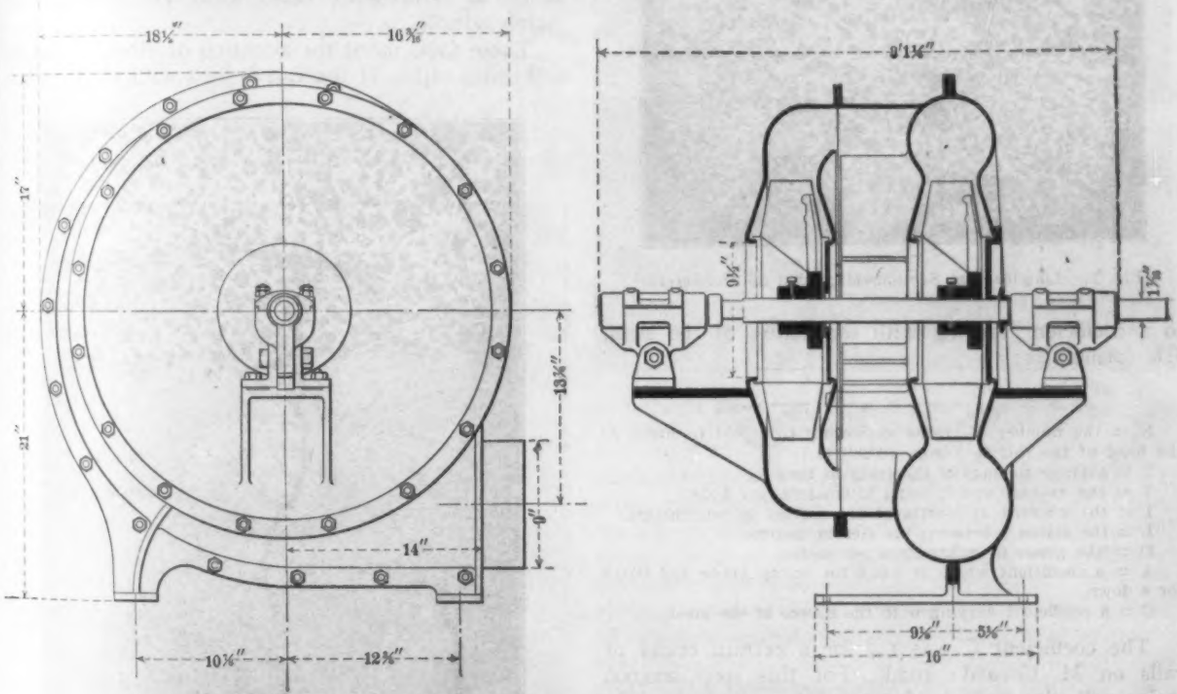


Fig. 2.—Side and Axial Sectional Elevations of a Buffalo Two-Stage Blower.

The blower shown in Fig. 1 is one of a lot of three installed in a railroad repair shop for furnishing the blast to furnaces which have a capacity of 1090 cu. ft. of air per minute at a pressure of 5 ounces per square inch, the operating speed being 1720 rev. per min. As compared with a standard centrifugal blower of the single stage type having the same pressure, the speed is much less, 2880 rev. per min. being the speed required to give approximately the same capacity where only one stage is used. This unit is only one of a large line which the company is prepared to build either regularly or to order. The standard line includes capacities up to 12,000 cu. ft. of air per minute at pressures ranging from 5 to 24 ounces per square inch.

The Coates Automatic Labeling Machine

The Coates Automatic Machine Company, recently incorporated, is successor to the Coates Mfg. Company that was formed August 11, 1909, for the purpose of manufacturing automatic machines for labeling, banding, wrapping and end sealing boxes, tubes, cans or bottles of any size or shape. The company's office and factory are located at 584 Hudson street, New York City. The machines manufactured are thoroughly automatic, requiring but one operator, occupying 3 x 3 ft. of floor space, and taking ½ hp. for operation. The speed of the different models varies from 25 to 100 packages per minute, depending upon the size of the article to be handled. The company states that it has installed its machines in quite a number of the largest concerns of their kind in the country, and these machines were accepted after severe tests and more were ordered. Larger factory room is under negotiation, as the demand for the machines makes it likely that the company will shortly be obliged to turn out at least 25 a month. The inventor of the machines manufactured by this company is Frederick Coates, who is also president. Franklin B. Coates is vice-president and treasurer. Maurice Levi is secretary and attorney.

The Great Lakes Engineering Works.—In connection with the issue of $750,000 of bonds of the Great Lakes Engineering Works, Detroit, Mich., which will be used to retire indebtedness and to build a new plant at Ashtabula, Ohio, a circular has been issued giving earnings in recent years and details of resources. Organized in 1903, the company has increased its capital and surplus from the original $600,000 to $2,750,000. The cost of the Ashtabula plant will be about $400,000. Real estate, plant, &c., are put at $2,577,789. The net earnings were $347,801 in 1905-6, and in the next three years $184,725, $436,792 and $377,531, respectively, the year 1906-7 being a strike year. The estimated net earnings for 1909-10 are $350,000. The sales for the four years 1905-6 to 1908-9 aggregated $14,785,000.

The Metal Dross Economy Process

Apparatus for Recovering Metal and Charcoal from Crucible Skimmings

Brass foundries will be interested in the process for skimming metal drosses patented by the Metal Dross Economy Company, Bristol, Conn. Briefly the process consists of skimming the drosses from the crucible in the usual way, but letting them fall into a pot of water instead of on a skimming heap, keeping them wet until time to separate them through a se-

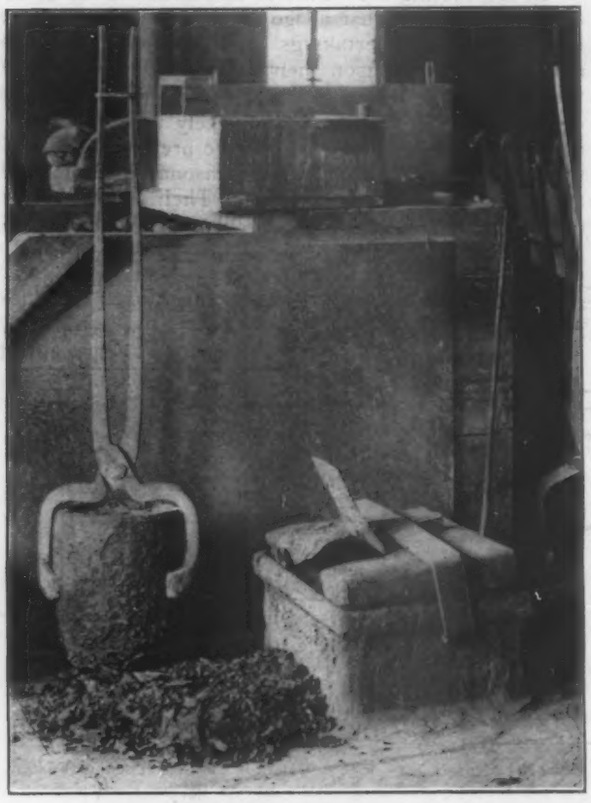


Fig. 1.—The Skimming Tank Used in the Process Patented by the Metal Dross Economy Company, Bristol, Conn.

ries of superimposed sieves through which they are washed by water. It is claimed that 60 per cent. more skimmings can be saved in this way than by the use of a stamping mill or crushing barrel, as in the latter all of the smallest shot and thin pieces are ground up and lost, and that 90 per cent. more is saved than by any other way where no crushing machine is used. To show the waste of the old process, 60 lb. of clean metal that had passed a No. 30 sieve was mixed with ashes taken from the casting shop fires and ground. Including the metal that was in the ashes only 21½ lb. of clean metal was recovered, proving that the amount of fine stuff that is ground into powered dust becomes lighter than the hard cinders and is washed away by the water. The Economy process by contrast is claimed to save everything including the oxides.

The skimming tank, Fig. 1, is a cast iron box, 20 x 22 in., 16 or 20 in. deep, with a steel top in which there is a funnel-shaped opening about 8 in. square. Over this is a shield at an angle of about 45 degrees, which protects the caster from the heat, dirt and much of the smoke, which is so objectionable in skimming metal in the usual way. The tank should be set in the floor, so that the top is about 4 or 5 in. below the top of the crucible, and should be kept filled with water to within 2 in. of the top. The skimming of dross into water immediately stops the spelter smoke and does away with the skimming heap, conducing to a clean casting shop. As soon as the dross strikes the water all oxidation of metal ceases, whereas by the old way the brass continues to oxidize even after it has been skimmed and lies on the heap. The zinc oxide immediately separates from the metal upon reaching the water and takes the form of different sized pellets.

At the end of the day or any other convenient time, the tank is cleaned out. The skimmings should not be allowed to dry, as the oxide of zinc will then adhere to particles of the brass and become much harder to clean off, and the very fine shot metal will also be more difficult to save. The skimmings may be put in a barrel and kept wet until a more convenient time for cleaning. A barrel will hold the dross from 500 to 800 No. 30 crucibles, if it is run through a No. 8 riddle and the larger pieces taken out. By the Economy process all the charcoal that remains unburned is saved, and may be returned to the crucibles. The tanks are made in two sizes, No. 1 holding the skimmings from 50 No. 25 crucibles, and No. 2 from 60 No. 70 crucibles. The water will remain at about the same depth in the tanks, no matter how much dross or charcoal may be skimmed into it, due to the oxides taking up some of the water and some of the water evaporating.

The metal dross separator, shown in Fig. 2, separates the oxides from the metal. It is made of cypress wood, and is in the form of a tier of drawers with wire cloth bottoms of different meshes secured with cleats and brass screws, so that they may be easily renewed. The dross from the tank, about a scoop shovelful at a time, is put into the top drawer, and any lumps of coal or sand balls containing brass or large pieces of brass are taken out. The sand balls can be run through a crushing machine or sold as junk in that form. Everything that remains in the other drawers goes back to the casting shop, and can be used either wet or dry. If used wet, it is better to

Fig. 2.—The Metal Dross Separator, in Which the Charcoal, Metal and Oxides Are Separated by Washing.

put it in the crucible when the pot is charcoaled, putting it on top of the charcoal, or on top of chips, or in any way so that the water will not get under the metal. It also makes a good flux and helps to stop oxidation, and does not gum or stick up the pot. In most foundries the metal saved one day is used the next, and divided about an equal amount to each crucible. What little brass works through the bottom cloth into the water reservoir of the separator can be rewashed, so that there will be nothing but the oxides that will wash away and they may be saved if de-

sired, although after going through the second process they have little value. One user of the process is reported to have saved from the melting of over 5,000,000 lb. of brass everything that came out of the tanks, except about two-thirds of a hogshead of oxides, which was so low in metal content as to be unmarketable. It takes only about 15 minutes to clean a tank of skimmings. The operation consists simply of turning a hose in the top of the separator and letting the water percolate through, being careful not to overload the apparatus.

The New Edwards Corrugated Steel Roof

Corrugated steel is a very popular roofing, but as ordinarily manufactured it has some disadvantages. These, it is claimed, have been overcome in a new corrugated sheet steel roofing recently placed on the market by the Edwards Mfg. Company, 545 Eggleston avenue, Cincinnati, Ohio. Fig. 1 shows the roofing applied to a building with steel purlins, and Fig. 2 gives some of the details of the special cleat used.

The use of wood for studding or rafters has almost entirely been abandoned and steel substituted, the sheet steel being afterward applied either as roofing or siding. The Edwards patent pressed standing seam corrugated roofing is said to be especially adaptable for

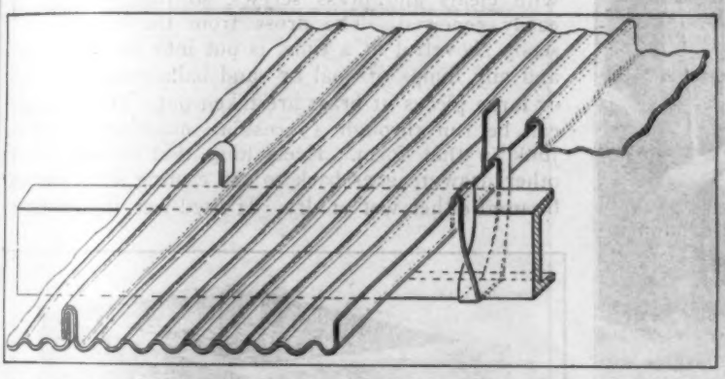


Fig. 1.—Pressed Standing Seam Corrugated Roofing, Made by the Edwards Mfg. Company, Cincinnati, Ohio.

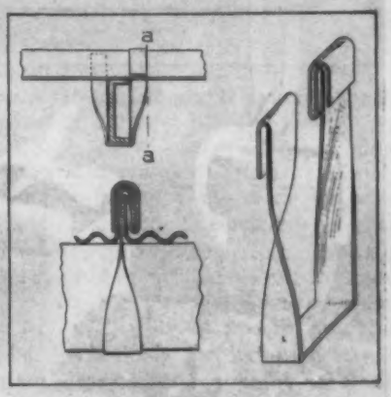


Fig. 2.—Details of Cleat Used to Fasten the Sheets to the Purlins.

use on buildings of this character, as will be seen from the accompanying illustrations. This roof has the advantage of perfectly tight seams, and can be applied to the purlins directly without rivets of any kind. This last feature is one whose importance is sometimes overlooked, as it is well known that practically all forms of iron and steel roofing deteriorate first at the points where the rivets pass through them. These points must, of course, withstand the strain of vibration and wind pressure. Where the sheets are galvanized, puncturing the sheets for the rivets exposes the raw metal, and the broken coating permits the sheet to rust, which is aggravated by the vibration.

Lapping two corrugations of the sheets was formerly considered necessary, but with this new roofing a saving of 11 per cent. in the amount of material required can be effected on the side seams alone. In addition to this saving of material a tighter side lock is secured. It is practically impossible to rivet a cleat tight enough to corrugated roofing to eliminate vibration when the cleat is passed under the purlin. With the type of cleat used in securing this new roofing the vibration is decreased to give just the proper amount, while at the same time the cleat is securely fastened to the steel sheet.

Other special advantages of this roofing are that it can be placed on the roof and worked entirely from above, which is a feature particularly valuable where the roof is high and hard to scaffold, and an entire roof can be put on without using rivets of any kind or puncturing the sheets. It can also be applied more closely to the purlins, and much more quickly, it is said, than any other form of corrugated roofing. While this roofing is primarily intended for use on buildings having steel purlins, it can be applied on wood purlins or sheathing boards equally well, the cleat in this case being nailed to the purlins or sheathing so as to conceal them completely after the roof is complete.

An English View of Our Industrial Companies

The London *Statist* of August 27, in the course of an editorial discussion of the economic situation in the United States, says:

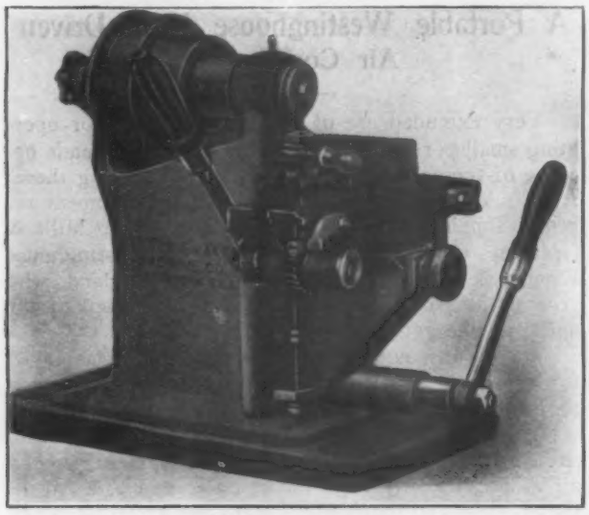
In considering the values of industrials it should be clearly recognized that no government can prevent its manufacturing undertakings from earning a reasonable rate of profit upon their capital. Our studies of the matter have led us to conclude that neither President Taft nor Mr. Roosevelt is likely to propose any measure which would be intended to prevent the industrial companies from earning a reasonable—in fact, a relatively high—rate of profit. Their efforts must necessarily be directed to the prevention of monopolies created for the purpose of securing unduly high prices from the public. Companies having for their object the supply of a product at a reasonable price will make larger profits than undertakings desiring to extort unduly high prices from the public, and statesmen must, and doubtless will, foster enterprises which seek to earn profit by economy of production and relatively low prices of commodities.

The principles of a large turnover and a small profit per unit have long been recognized as those which give the most profitable results. These are certainly the principles which have raised American railroads to their present high degree of prosperity, and they are also those of the more wisely administered and progressive industrial companies. The latter have no cause to apprehend the passage of any legislation which will adversely affect their prosperity. It is not improbable that the existing legislation will be modified in order to render legal undertakings which are willing to trade under these conditions and to justify their existence by selling their products to consumers at a reasonable price. In these circumstances the alarm concerning the future of the industrial companies of the United States is unwarranted, and those persons who place their faith in the good sense of the American people and anticipate a satisfactory solution of the present "trust" difficulty will find it advantageous to purchase the shares of the industrial companies at their current depreciated level of values.

Correction.—In the item relating to the Harriman rotary engine which was printed on page 483 of *The Iron Age* September 1, 1910, the name of the inventor was misspelled. It should have been J. Emery Harriman, Jr.

The New Carter & Hakes Bench Miller

A new bench hand miller which is especially designed for the light work which is made in large quantities by makers of guns, sewing machines, typewriters, electrical work and numerous other lines, has been placed on the market by the Carter & Hakes Machine Company, Winsted, Conn., and is illustrated herewith. This machine is of the same design as the old model of the company, but it has been improved in a number of



The New Bench Milling Machine Made by the Carter & Hakes Machine Company, Winsted, Conn.

details. Among these are a larger and longer spindle bearings, a larger cone pulley and a wider belt for driving the machine and a solid box type of knee with a wider and longer bearing surface on the column instead of the side rib or web model. The carriage and table have both been made longer and wider and in addition sliding stops with a fine screw adjustment have been provided, which also has both a crank and a knob for operating. The screw for the transverse adjustment of the carriage has its index graduated in thousandths of an inch.

The miller is designed with the intention of saving as much floor space as possible and may be set on a bench as its name indicates, while a number of them may be set on a bench or separate platform which takes up comparatively little room. The vertical and horizontal feeds are equipped with the customary rack and pinion operated by hand levers. The spindle is bored to receive a draw-in collet having a ½-in. hole, and if desired a cutter arbor to be used either as a substitute for or in addition to the regular collet can be furnished. The vise is operated by a lever which is different from those ordinarily employed for this purpose, but it is claimed that the vise will grip the work as securely as a screw-operated one and in addition is much quicker in opening and closing.

The following table gives brief dimensions and specifications of the tool:

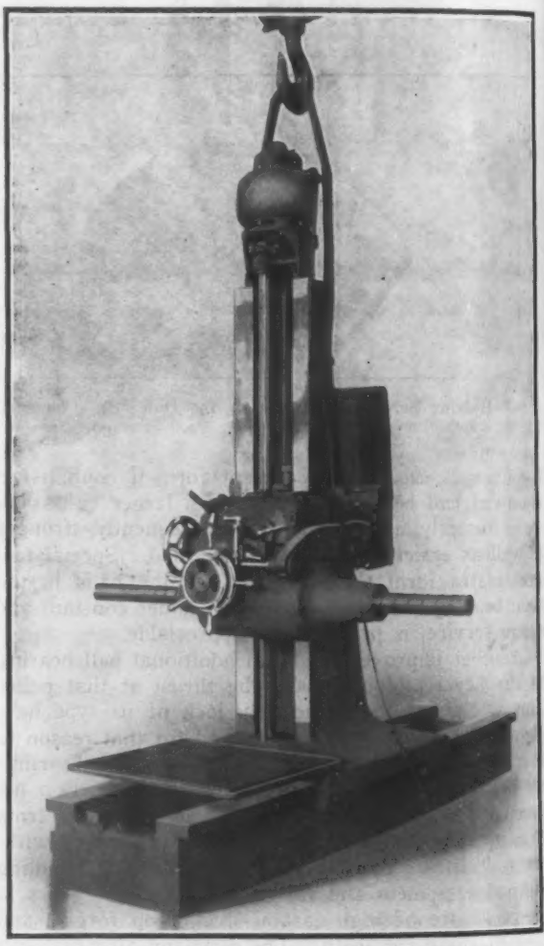
Weight, lb.	100
Total bench space required, in.	21 x 17
Longitudinal feed of table, in.	4
Cross motion in line with spindle, in.	2¼
Vertical movement of knee, in.	4
Maximum distance table to spindle, in.	4¼
Dimensions of table, in.	3 1-16 x 10¼
Speed of countershaft, rev. per min.	240
Total hight, in.	14¾
Dimensions of base, in.	6½ x 10½

The equipment regularly furnished includes an overhanging arm to support the cutter arbor, a taper sleeve for the spindle with hole for the collet, a lever vise, countershaft and the necessary wrenches.

Duralumin, a New Aluminum Alloy.—Announcement comes from Great Britain that a new alloy of aluminum, named duralumin, has been brought out by H. B. Weeks, head chemist at the works of Vicker's Sons & Maxim, Barrow, England. The alloy is described as only a little heavier than pure aluminum, but as strong as steel. The statement is made that this alloy can be rolled, drawn, stamped or forged at suitable temperatures, and that it is much less easily corroded than other aluminum alloys. The firm is building new works at Birmingham for the purpose of manufacturing the metal, on which patents have been secured throughout the world. It is expected that the production of the alloy on a commercial scale will begin in October.

A Portable Rochester Horizontal Boring Machine

A new and somewhat novel use is being made of the Rochester horizontal boring machine, built by the Rochester Boring Machine Company, Rochester, N. Y., which was illustrated and described in *The Iron Age* June 30, 1910. The accompanying engraving shows the machine ready for use as a stationary or portable machine, the change being made by simply disconnecting the column and the column slide from the floor plate. Thus the head and face of the machine can be



The Horizontal Boring Machine Built by the Rochester Boring Machine Company, Rochester, N. Y., Made Portable.

readily handled by a crane and moved to any part of the shop where this may be easier than moving a heavy piece of work to the machine.

The column slide has screws designed for pushing the head away from the floor plate a sufficient distance to permit the dowel pins which are used to locate the machine on any part of the floor plate to be withdrawn from the plate, after which the crane can pick it up easily. This makes the machine equally applicable for either stationary or portable work and enables it to be used very conveniently in a number of places.

Duff Ball Bearing Screw Jacks

One of the most popular lines of jacks made by the Duff Mfg. Company, N. S., Pittsburgh, Pa., and sold through Fairbanks, Morse & Co., Chicago, Ill., is the Duff ball bearing screw jack. It is made in several types and sizes covering all those used in car shops,

A Ball Bearing Screw Jack Made by the Duff Mfg. Company, N. S., Pittsburgh, Pa.

roundhouses, &c. In its present form it contains an improved ball bearing, having much larger balls than were formerly used, which are consequently stronger as well as easier to operate under load. Special tool steel plates form the raceways for the balls in the main bearing and their wear, even under constant and severe service, is practically inappreciable.

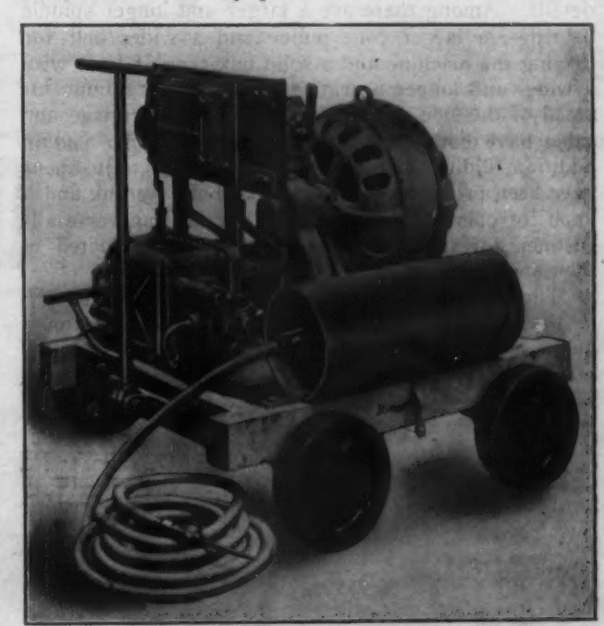
Another improvement is an additional ball bearing on the bevel pinion to take the thrust at that point. This is claimed to be the only jack of its type having a ball bearing at this point, and for that reason to be much easier to operate. The balls in both bearings are separated by bronze cages to reduce friction between balls. The jacks are made in capacities from 10 to 75 tons, and in various sizes and with and without foot lifts. Special sizes are built for handling railroad equipment and for shop work. The gears in the jacks are of high carbon steel, drop forged, and have machine cut teeth. The company also makes a cone bearing journal jack used by car inspectors, which is furnished in capacities of 10 to 15 tons.

Newberry Furnace Improvements.—Ground has been broken at Newberry, Mich., for the erection of a modern retort plant to be operated in connection with the Newberry Furnace of the Lake Superior Iron & Chemical Company. The plant will occupy a building 72 x 300 ft. in size, aside from the cooling houses, and will necessitate the construction of 4 or 5 miles of additional track in the company's railroad yards. With the new works in commission, the present kiln method of manufacturing charcoal will be abandoned and the kilns will be torn down. The new process will not only yield a much larger production of wood alcohol, but will permit the saving of additional by-products. A new policy also has been adopted in regard to the timber operations of the company. All merchantable wood is to be manufactured hereafter and for this purpose a thoroughly modern sawmill is to be erected. The improvements will entail an expenditure of $250,000, and will require nearly a year for their completion.

A Portable Westinghouse Motor-Driven Air Compressor

Very extended use of the electric motor for operating small portable equipments is now being made because of the convenience and economy resulting therefrom. A small portable air compressor equipment recently supplied to the Rio de Janeiro Flour Mills & Granaries Company, Ltd., by the British Westinghouse Electric & Mfg. Company, Manchester, England, who recently also furnished the electrical equipment of the mills, is illustrated herewith.

The outfit is entirely self-contained and is employed for blowing dust out of the 600-hp. motors with which the mills are equipped and for cleaning other machinery. This form of cleaning is considered superior to any other for electrical machinery, as the compressed air issuing directly from the compressor blows out all the crevices and thoroughly cleans the armature windings without affecting the insulation of the coils, which is almost as important as keeping the machinery free from dust. The equipment furnished consists of a



A Portable Motor-Driven Air Compressor, Built by the British Westinghouse Electric & Mfg. Company, Manchester, England.

standard Westinghouse airbrake compressor driven by a 3-hp. three-phase Westinghouse squirrel cage motor through single reduction gearing, and together with the control panel, which is of slate on a strap iron frame, is mounted on a wooden base with rubber-tired wheels, so that it can be moved easily from point to point.

A flexible cable with a plug on the end leads the current used to drive the motor from outlet boxes on the wall to a three-pole double-throw switch inclosed in an iron box and then through a unit type fuse box to the motor. By a special arrangement of the connections the fuses are cut out of the circuit when the motor is thrown on the line at starting and after the operating speed is attained the switch is thrown over and the fuses are cut into the circuit.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1⅜ in. round and square	₩ ℔ 1.90¢
1½ to 4 in. x ⅜ to 1 in.	₩ ℔ 1.90¢
1½ to 4 in. x ¼ to 5-16	₩ ℔ 2.10¢
Rods—⅜ and 11-16 round and square	₩ ℔ 2.10¢

Angles:	Cts ₩ ℔
3 in. x ¼ in. and larger	2.10¢
3 in. x 5-16 in. and ⅜ in.	2.20¢
1½ to 2½ in. x ¼ in.	2.20¢
1½ to 2½ in. x 5-16 in. and thicker	2.10¢
1 to 1¼ in. x 5-16 in.	2.20¢
1 to 1¼ x ⅜ in.	2.30¢
⅞ x ¼ in.	2.40¢
¾ x ¼ in.	2.50¢
⅝ x ¼ in.	3.55¢
⅜ x 3-32 in.	4.35¢

Tees:

1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 5-16 in.	2.35¢
3 in. and larger	2.15¢
Beams	2.10¢
Channels, 3 in. and larger	2.10¢
Bands—1½ to 6 x 5-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

	per ℔
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black	One Pass, C.R Soft Steel.	R. G. Cleaned.
No. 16	₩ ℔ 2.90¢	3.00¢
Nos. 18 to 21	₩ ℔ 2.95¢	3.10¢
Nos. 22 and 24	₩ ℔ 3.05¢	3.20¢
No. 26	₩ ℔ 3.10¢	3.30¢
No. 28	₩ ℔ 3.20¢	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₩ ℔ 12 @14½

Patent Planished, W. Dewees Wood, ₩ ℔ A, 10¢; B, 9¢ net.

Galvanized.

Nos. 14 to 16	₩ ℔, 3.20¢
Nos. 18 to 24	₩ ℔, 3.55¢
No. 26	₩ ℔, 3.75¢
No. 28	₩ ℔, 4.10¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—Galvanized.

Nos. 22 and 24	₩ ℔ 5.75¢
No. 26	₩ ℔ 6.25¢
No. 28	₩ ℔ 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24	₩ 100 sq. ft. $3.55	4.90
No. 26	₩ 100 sq. ft. 2.95	4.00
No. 28	₩ 100 sq. ft. 2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:

IC, 14 x 20	$6.33
IX, 14 x 20	7.60

A. Charcoal:

IC, 14 x 20	$5.40
IX, 14 x 20	6.50

American Coke Plates—Bessemer—

IC, 14 x 20 107 ℔	$4.40
IX, 14 x 20	5.40

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.50
IX, 20 x 28 with an 8 lb. coating	10.50

Seamless Brass Tubes—

List November 11, 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price 18¢

Copper Tubes—

List November 13, 1908. Base price 22¢

Brazed Brass Tubes—

List August 1, 1908. 19½¢ ₩ ℔

High Brass Rods—

List August 1, 1908. 14½¢ ₩ ℔

Roll and Sheet Brass—

List August 1, 1908. 14½¢ ₩ ℔

Brass Wire—

List August 1 1908 14½¢ ₩ ℔

Copper Wire—

Base Price. Carload lots mill 14 ¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₩ ℔ 18 ¢

Sheet Copper Cold Rolled, 1¢ ₩ ℔ advance over Hot Rolled.

Sheet Copper Polished 20 in. wide and under, 1¢ ₩ square foot.

Sheet Copper Polished over 20 in. wide, 2¢ ₩ square foot.

Planished Copper, 1¢ ₩ square foot more than Polished

METALS—

Tin—

Straits Pig ₩ ℔ 36¼@

Copper—

Lake Ingot	₩ ℔ 14@
Electrolytic	₩ ℔ 14@
Casting	₩ ℔ 14@

Spelter—

Western ₩ ℔ 6@

Zinc.

No 9, base, casks ₩ ℔ 8 ¢ | Open ₩ ℔

Lead.

American Pig	₩ ℔ 5 @
Bar	₩ ℔ 6@

Solder.

½ & ½, guaranteed ₩ ℔ 21@

No. 1 ₩ ℔ 20@

Refined ₩ ℔ 18 @

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ ℔
Halletts	
Other Brands	@

Bismuth—

Per ℔ $2.00@2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in lots for remelting

Rods & Wire Base Price

Sheets Base Price

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible	₩ ℔ 10.75@11
Copper, Heavy and Wire	₩ ℔ 10.50@10
Copper, Light and Bottoms	₩ ℔ 9.50@
Brass, Heavy	₩ ℔ 7.25@
Brass, Light	₩ ℔ 5.75@
Heavy Meching Composition	₩ ℔ 9.50@
Clean Brass Turnings	₩ ℔ 7.00@
Composition Turnings	₩ ℔ 8.25@
Lead, Heavy	₩ ℔ @
Lead, Tea	₩ ℔ @
Zinc Scrap	₩ ℔ @

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